DOCUMENT RESUME

ED 160 243	PS 010 171
AUTHOR	Granville, Arthur C.; And Others
TITLE	A Process Evaluation of Project Developmental Continuity, Interim Report VII, Volume 3: Assessment of Program Impact Through the Head Start Year.
INSTITUTION	High/Scope Educational Research Foundation, Ypsilanti, Mich.
SPONS AGENCY	Office of Child Development (DHEW), Washington, D.C. Early Childhood Research and Evaluation Branch.
PUB DATE	Aug 77
CONTRACT	HEW-105-75-1114
NOTE	198p.; Some tables in this document may be marginally legible due to small print size; For related documents, see ED 144 715, PS 010 163-170, and PS 010 172-176; This series includes all the public reports generated by this study
EDRS PRICE	MF-$0.83 HC-$10.03 Plus Postage.
DESCRIPTORS	*Classroom Environment; Data Analysis; Data Collection; *Demonstration Programs; *Early Childhood Education; Feasibility Studies; Formative Evaluation; Instrumentation; Measurement Instruments; *Program Effectiveness; *Program Evaluation
IDENTIFIERS	*Developmental Continuity; *Project Developmental Continuity; Project Head Start

ABSTRACT

This interim report, part of a series of documents examining the feasibility of the longitudinal evaluation of Project Developmental Continuity (PDC), presents the results of an analysis of PDC impact at the Head Start level, using Spring 1977 data. PDC is a Head Start Demonstration Program aimed at providing educational and developmental continuity between children's Head Start and primary school experiences. Chapter I provides a brief introduction to the feasibility study. Chapter II describes the methods of data collection and analysis. Chapter III presents the findings of the feasibility study. Characteristics of the sample and the basic instrument battery are described, and summaries are provided of the three developed and tested measures: the classroom observation system, the Preschool Productive Language Assessment Task (PPLAT), and the Adult Language Check, which are not part of the basic battery. Chapter IV examines PDC program treatment effects. No substantial measured difference in progress between PDC and comparison children was found. (Author/RH)

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A PROCESS EVALUATION OF PROJECT DEVELOPMENTAL CONTINUITY, INTERIM REPORT VII, VOLUME 3:

ASSESSMENT OF PROGRAM IMPACT THROUGH THE HEAD START YEAR

August 1977

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PS 010171

Preface

Interim Report VII focuses on the third year of the PDC program evaluation. Volume 1 presents the results of our measurement of levels of program implementation; this is accompanied by detailed descriptions of implementation activities at the nine sites included in this part of the study. This third volume reports the results of the assessment of program impact from fall to spring of the Head Start year.

Previous reports, particularly Interim Report IV (August 1976) and Interim Report VI (March 1977), contain additional background information on the development and early phases of the implementation and impact studies. Throughout this report the reader is referred to these previous documents where appropriate.

The preparation of the implementation volumes has involved an unusual amount of interchange with staff of the PDC programs. Each site whose data are presented in Volumes 1 and 2 has reviewed and commented on earlier drafts of these sections. The diligence of PDC staff has helped immensely in correcting some factual information and interpretations. Where possible, we have made changes in accordance with their suggestions. In rare instances where we felt an alternative interpretation was justified, we have employed footnotes to indicate the reason for our difference with the site. The entire PDC staff willingly gave many hours of their time in keeping records, collecting information, granting interviews, and arranging for testing. We are also indebted to teachers who permitted us access to their classrooms; parents who gave permission for their children to be tested; and the children themselves who willingly cooperated with our testing without any real appreciation of either how critical they are as a source of information, or how important they are in all our minds as the ultimate reason for striving to develop better programs and services.

John M. Love, Project Director
Developmental Continuity Evaluation

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I

INTRODUCTION

Purpose of the Evaluation

In the summer of 1974 HEW's Office of Child Development (now the Administration for Children, Youth and Families) began a new demonstration program aimed at promoting greater continuity between the preschool and elementary school experiences of Head Start children. This effort, named Project Developmental Continuity (PDC), incorporated a major program evaluation as well. For three years, the High/Scope Educational Research Foundation has worked with its subcontractor, Development Associates, to provide data that would aid the Administration for Children, Youth and Families (ACYF) in its efforts to design and implement early childhood education programs.

The evaluation includes two major components--an Impact Study and an Implementation Study. The Impact Study, for this initial three-year period, has been designed to assess the feasibility of studying program impact as children progress from Head Start through third grade. As part of this feasibility study we have examined the suitability of the measuring instruments, assessed the comparability of the PDC and comparison groups, and projected sample attrition through third grade. In all three respects, we have concluded that a longitudinal study is indeed feasible (see Interim Report VI: Executive Summary, April 1977). The present report reexamines these issues using spring 1977 data, but also goes beyond questions of feasibility to provide an analysis of PDC's impact on children at the Head Start level. In the projected longitudinal study, program impact will be conceptualized more broadly to include parent participation and attitudes, teacher attitudes and work styles, and the organizational climates of the schools, in addition to the impact on children's social competence that has been the focus thus far.

Purposes of this Report

This volume has as its chief purpose that of presenting the results of analysis of PDC impact at the Head Start level. Chapter II describes the methods of data collection and analysis, and Chapter III presents our findings. The first findings relate to characteristics of the sample and characteristics of the basic instrument battery. Analyses of instrument characteristics have been deemphasized in this report due to the thorough examination that was provided in previous reports (see especially Interim Report VI, March 1977). The third section of Chapter III, Characteristics of Supplemental Instruments, provides succinct summaries of three measures that have been developed and tested during the first years of the study, but which are not part of the basic battery on which attention has focused in previous reports. In the final section of Chapter IV, the Head Start-level treatment effects are described and discussed, and in Chapter V conclusions are drawn on the basis of all the findings.

Limitations on the Impact Study

The completeness and breadth of this report on the first phase of the PDC evaluation has been constrained by the inability to employ several key data collection instruments. This circumstance exists because clearance was not received from the Office of Management and Budget (OMB) for the necessary instruments. The Impact Study, originally conceptualized as a broad assessment of impacts on parents, teachers and the institutions as well as on children, has thus far been limited to a study of impact solely on children because two key Impact Study instruments could not be used. One is a Teacher Survey developed to assess teachers' attitudes and perceptions of PDC and their own institutions. The second is a Parent Survey designed to obtain information on the extent of parent participation in and attitude toward the program. Thus this report focuses exclusively on PDC's impact on the performance of children as measured by tests, ratings, and observations.

II

METHODS

Data Collection Procedures[1]

To establish a data collection routine that would result in data of the highest possible quality, the procedures followed in the three preceding data collection periods were continued with minor modifications:

- An organizational structure for individuals involved in the data collection effort was outlined, role responsibilities were defined, and a detailed training manual was produced.
- A training model was designed that specified tester performance standards and provided for individual two-day tester training sessions in each site.
- Onsite monitoring of testers by trainers was conducted during the training sessions prior to the start of the actual testing.
- During the data collection period, testers were responsible for monitoring each other's performance on a weekly basis.
- Site coordinators collected completed data each week and checked it for obvious errors or omissions before sending it to the High/Scope Foundation.

Each of these procedures is discussed below.

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[1] The tests and other instruments used, and the order of their administration, are described in Appendix A. Further details on testing, monitoring, and other procedures followed by testers onsite can be found in the Field Procedures Manual (High/Scope Foundation, March 1977).

Field Organization[1]

The roles of the personnel who conducted field data collection were explicitly defined in the Field Procedures Manual in order to systematize responsibilities. For example, site coordinator responsibilities included contacting the PDC coordinator regarding the start of testing; setting up and chairing a meeting with the Head Start teachers involved in the evaluation, or contacting them individually; keeping in contact with High/Scope's supervisor of field operations about the status of data collection and any problems that the site was having; checking all completed data on a weekly basis; keeping up-to-date records on the status of the data collection; carrying out any needed training; testing (and, in some cases, observing) children; and monitoring testers.

Training Model

Training sessions for both trainers and testers were held in early March 1977. Since all six trainers had been involved in previous PDC training sessions, a brief, two-day session was held to review and practice the child measures and to review the observation system and code videotapes. A major change in the training model was made by holding separate tester training sessions at each site rather than having one session for the entire group at Camp High/Scope. Because the majority (82%) of the testers had collected PDC data previously it was deemed unnecessary to bring them all to Michigan. (In fact, almost half of the testers had collected PDC data during each of the previous three data collection periods.) A High/Scope trainer was sent to each site for a two-day "refresher" training session. In those three sites where testers were newly hired, the training sessions lasted four to five days.

Tester training. During the onsite tester training sessions, each test was reviewed and practiced. Practice sessions involved the use of test "scripts." The scripts consisted of test instructions, child responses, and rationales for scoring. In using the scripts, two testers would pair up and one, the "child," would perform as indicated on the script while the other tester administered the test without the script. This provided an excellent learning situation since the child responses included on the script covered all the administration rules and gave the testers a chance to work with and correct each other.

---

[1] The spring data collection began the week of March 14 at all sites except Florida. The length of the data collection period was fairly constant across sites, with most testers finishing within nine or ten weeks. In Florida, testing began in early April and took 12 weeks to complete. The number of testers per site ranged from one (in Georgia) to four, depending on the sample size.

Since it is critical that testers administer the tests in a standard way, each tester was systematically "checked-out" on all of the child measures before the end of the training session. During this procedure a trainer played the role of the child (also recording the "child's" responses) while a tester administered one or more of the child measures to her. The trainer (acting as the child) responded in standard ways to each item on each test in order to insure that (1) each tester was exposed to the same situations, and (2) the trainer could assess the tester's handling of critical child responses. For example, on the PIPS interview, there are specific things for the tester to say if the child gives an unrelated answer, a repeated answer, refuses to answer, and so on. By exhibiting all these behaviors in the check-out situation, trainers were able to assess the tester's understanding and expertise in administering each of the child measures.

Standards were set for acceptable performance during the tester "check-outs," and if these standards could not be met, additional training and practice was prescribed. Check-outs were then repeated at a later time during the training session to insure correct test administration.

Observation training. During each onsite training session, a half-day was devoted to reviewing and practicing the observation system. In previous training sessions one tester from each site had been identified and trained as the PDC classroom observer; it was this person that the trainer worked with. During this time the trainer reviewed those categories or items that the observer had problems coding during the fall observation training and responded to any questions the observer may have had. The observer and trainer then spent at least an hour in a classroom observing together and discussing their codings.

This procedure was followed in all but four sites; in two sites, Florida and Georgia, there were no experienced observers so the High/Scope trainers collected the data, and in two other sites the observers were identified as having more difficulty with the observation system than other observers so an intensive three-day training session was held for them.

Monitoring

Onsite monitoring. The onsite monitoring occurred during the training sessions. At this time each of the newly hired testers was required to administer the PDC measures to a child while the trainer observed. After watching a tester, the trainer provided any additional feedback to the tester that was necessary for improving her interactions with the children. This procedure served two purposes: it gave the trainer an indication of how well the new testers could establish rapport and interact with children, and it helped alleviate some of the anxieties the inexperienced testers felt about administering the measures to children.

Weekly monitoring. During the course of a testing week, testers alternately monitored each other; the one acting as monitor simultaneously completed the test booklets and the individual monitoring forms for each test. After the session, the monitor and tester discussed any errors, and the monitoring booklets and forms were sent to the supervisor of field operations at the High/Scope Foundation to be reviewed. Interim Report VI (March 1977) presented the monitoring forms from the fall testing; the spring monitoring forms reflected similar ease of administration and absence of major test errors.

Weekly Pre-Transmittal Data Checks

Testers were required to give or send their completed data to the site coordinator at the end of each week. The site coordinator then checked these tests, plus any she had completed, for recording/scoring errors. (Site coordinators and interviewers had reviewed a checklist specifying what to look for when reviewing each completed booklet, e.g., "Is the identification complete?" "Did the interviewer fail to give a second trial when it should have been given?" "Did the interviewer skip an item?") Errors were pointed out to the particular tester and, if necessary, further training was provided by the site coordinator. The site coordinator also kept track of all completed data (in addition to the individual records each tester kept of her classes) and mailed the completed data to the High/Scope Foundation on a weekly basis.

Recording and Scoring of Data

In addition to the site coordinators' pre-submittal check, data collected by inexperienced testers were also checked by the supervisor of field operations at the High/Scope Foundation. Errors in recording or coding were identified and explained to the site coordinator, who then discussed them with the other testers.

Once the raw data had been screened for accuracy at High/Scope, they were sent to the data processing section to be tagged with unique identification numbers for each student, scored and verified, then keypunched and verified.

Data Collection Sequence

To facilitate data collection, each PDC and comparison class was assigned to one or more of the site's testers (depending on the number of classes at a particular site) and the order of classes to be completed was specified. Two factors were taken into account in making these class assignments: (1) the data had to be collected simultaneously in the PDC and comparison schools to insure that both groups were observed/tested during the same time period, and (2) each tester had to be assigned to test both PDC and comparison children, thus eliminating the possibility of tester bias for either group. In most cases, testers were assigned to the same classes they had tested in the previous fall. Testers felt that the children would remember them and, as a result, be more relaxed during the testing sessions.

Determining Child's Language Capabilities

The procedure followed by testers in determining the language capabilities of children in the testing sample was (1) to ask the child's classroom teacher for his or her judgment, (2) to observe the child's verbal behavior in natural classroom conditions, and (3) on the basis of these indications, to administer the English or Spanish version, or both, of the Bilingual Syntax Measure (BSM). In most cases, this screening process produced consistent conclusions, and subsequent testing was accordingly conducted in English or Spanish or both. (In some cases this screening process led to the conclusion that a child was proficient in some third language, but not English or Spanish; these children were excluded from the testing sample.) When the screening process proved inconclusive, the tester carefully weighed all available information to reach a conclusion about the child's language capabilities.

Data Analysis

The procedures involved in analyzing data for this report, and the purposes of the analyses, are summarized briefly in this section.

Descriptive Characteristics of the Samples

Simple descriptive characteristics were computed for children in the PDC and comparison samples at each site in order to characterize the composition of the sample in general. These statistics are based on the full sample of children tested, but analyses were carried out on an analytic subsample that excluded children who have handicaps likely to impair test performance unduly or whose dominant language is not that of their local testing sample.

Attrition

Children who dropped out of the testing sample since fall were compared with children remaining in the sample on a number of background variables and on fall 1976 test scores. The hypothesis that attrition is unbiased on these dimensions was evaluated by means of t tests and chi square analyses. The purpose of this phase of analysis was to determine whether any selection effect may be operating that diminishes the representativeness of the total sample remaining. The PDC and comparison children who remained in the sample were also compared to test the current comparability of the remaining samples.

Characteristics of the Instruments

Because all the instruments in the battery have, in earlier PDC analyses, passed through at least two screenings based on psychometric criteria,[1] no further screening was considered necessary before the data were entered into the analyses reported here. The psychometric analyses that are presented in this report are included because they contribute to the conceptual definition of the various measures. These analyses are described briefly below.

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[1] Complete results of psychometric analyses for instruments in the present battery can be found in Interim Report VI: Recommendations for Continuing the Impact Study, March 1977 and in Interim Report IV, Volume I: Pilot Year Impact Study: Instrument Characteristics and Attrition Trends, August 1976.

Sensitivity to change. These analyses examine the ability of each instrument to detect systematic change over time in the characteristics measured. Two approaches were taken. First, a pairwise t test was performed to determine the significance of the difference between fall and spring scores on each measure. If the traits tapped by the instruments in the battery change from fall to spring, then the measures of them should also change. Thus the expectation was that a significant fall-to-spring increase would be found for each measure. However, even if this approach produces a finding of significant change, it offers no basis for concluding whether or not the change is as great as one would expect in view of the effects of maturation and the school program. The second analysis, therefore, examined spring scores with respect to scores that had been predicted for each child on the basis of the relationship between each measure and age. To establish the basis for this prediction, a regression analysis was performed for each fall measure to produce an equation that expressed the measure as a function of age, sex, ethnicity, treatment group, prior preschool experience, and number of siblings. Spring score on the measure was then predicted by inserting values of the independent variables in the equation for each child as of the spring testing date. Since the mean span between fall and spring testing was 5.5 months, the predicted score for spring was higher than the fall score by a value proportional to the age increase. The difference between predicted and actual spring scores on each measure was then evaluated by means of a pairwise t test. The expectation was that actual scores would be approximately equal to predicted scores if gain were due to maturation alone, and would be greater than predicted scores if the school experience were also contributing to gain.

Factor structure. All the measures included in the basic battery for English-dominant children (except WPPSI, which was administered in only four sites) were factor analyzed,[1] and the results are reproduced here in order to further illuminate the nature of the measures.

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[1] Principal components solution, varimax rotation.

Relationship to social competence. In another step taken to document the nature of the battery, proxy social competence criteria were constructed for children in the English-dominant sample, and the relationship of each measure to these criteria was determined by regression analysis. The "social competence" indices consisted of seven homogeneous scales (derived by factor analysis) from the PDC Child Rating Scale and the Pupil Observation Checklist. These instruments are completed by each child's teacher and tester, respectively. The rationale for selection of these indices was that a broad range of the child's characteristics--social, emotional, cognitive, linguistic, and psychomotor--is spanned when the teacher and tester assess the child's social behavior, and that these ratings thus reflect the integration of the elements of social competence--the configuration of traits that contribute to the child's everyday effectiveness.

Analysis of Supplementary Instruments

The Classroom Observation System is dealt with as separate from the basic battery since its unit of observation is the classroom. The purpose of the Observation System is to provide quantitative measures of the classroom environment, and the analysis presented here focuses on its suitability to that task. The Preschool Productive Language Assessment Task (PPLAT), designed as a naturalistic measure of productive language competence, was administered to PDC and comparison children in the Texas site. The analyses presented here examine the appropriateness of the PPLAT for use as a language assessment device on a wider scale in PDC and in other evaluations.

Examination of Treatment Effects

Analyses of variance or covariance were performed to determine what effect, if any, PDC has had on children's performance on the measures included in the basic battery. (The basic battery excludes the Classroom Observation System and the PPLAT.) Fall scores were used as covariates for spring scores, except for measures that had not been administered in the fall. Use of a factorial design allowed estimation of the treatment's effect on fall-to-spring gain after adjustment for the effects of sex, ethnicity, prior preschool experience, and site. (In the analyses performed for the Spanish-dominant sample, ethnicity was not included as a factor since virtually all the children involved are Hispanic.) This analytic procedure, by controlling for the influence on performance of factors other than the PDC program, yields a more precise assessment of program effect than would a less comprehensive analysis. At the same time it tends to compensate for preexisting differences between PDC and comparison children, if differences exist on the other dimensions incorporated in the analysis.

III

CHARACTERISTICS OF THE SAMPLE AND OF THE INSTRUMENTS

Characteristics of the Sample

General Description

A total of 1,075 children were tested at 12 PDC sites in spring 1977. Table 1 shows the number of children in the PDC and comparison groups at each site and describes the composition of each group in terms of handicap status, ethnicity, sex, and dominant language.

Not all of the 1,075 children tested entered into the analyses presented in this section; the actual number of children included is shown in the far right-hand column of the table. Excluded from the analysis were children whose dominant language was other than English (except for the Spanish-dominant children in California and Texas who comprise their own analytic groups); also excluded were children with handicaps judged likely to impair test performance unduly.

Attrition

Attrition trends. The rate of attrition among children in this year's testing sample (Cohort 2) is essentially the same as the rate found for children in last year's sample (Cohort 1)--about 12% overall. As Table 2 shows, there are site-to-site departures from last year's figures, but the patterns are similar. Thus there is a basis for regarding Cohort 1 children as harbingers, from year to year, of Cohort 2 attrition.

Analysis of the effect of attrition on comparability and representativeness. Table 3 shows the total number of children tested in fall 1976 and the number remaining from this sample in spring 1977. Overall, the sample was reduced by about 12% between the two testing points. The most common reasons for children's departure were moving away and withdrawal from the program.

Table 1
Descriptive Characteristics of the Samples
Spring 1977

		Number in Full Sample	% Handicapped	ETHNICITY					SEX		DOMINANT LANGUAGE		Number in Final Analytic Sample
				% Black	% Hispanic	% American Indian/ Native Alaskan	% White	% Asian/Pacific Islander	% Female	% Male	% English	% Spanish	
CALIFORNIA-ENGLISH	PDC	31	0	3	87	0	10	0	81	19	100	0	31
	Comp	21	0	5	67	0	29	0	62	38	100	0	21
CALIFORNIA-SPANISH	PDC	6	0	0	100	0	0	0	67	33	0	100	6
	Comp	11	0	0	100	0	0	0	55	46	0	100	11
COLORADO	PDC	50	8	8	76	0	16	0	50	50	100	0	46
	Comp	25	4	4	72	0	24	0	40	60	100	0	24
CONNECTICUT	PDC	53	11	41	36	2	13	0	43	57	72	28	37
	Comp	54	0	89	4	0	7	0	46	54	100	0	54
GEORGIA	PDC	43	7	70	0	0	30	0	51	49	100	0	40
FLORIDA	PDC	39	5	100	0	0	0	0	33	67	100	0	37
	Comp	35	0	85	12	0	3	0	53	47	100	0	35
IOWA	PDC	43	2	54	2	0	44	0	47	54	100	0	42
	Comp	48	2	25	2	2	69	2	48	52	100	0	47
MARYLAND	PDC	41	29	44	10	2	39	5	54	46	100	0	29
	Comp	47	23	40	26	0	23	11	45	55	100	0	36
MICHIGAN	PDC	58	10	64	3	0	33	0	43	57	100	0	52
	Comp	58	10	76	3	0	21	0	50	50	100	0	52
TEXAS-ENGLISH	PDC	23	0	4	30	0	65	0	52	48	100	0	23
	Comp	19	5	0	79	0	21	0	47	53	100	0	18
TEXAS-SPANISH	PDC	31	0	0	100	0	0	0	36	65	0	100	31
	Comp	36	8	0	97	0	3	0	58	42	0	100	33
UTAH	PDC	64	11	3	16	2	78	2	44	56	100	0	57
	Comp	54	9	6	18	9	69	0	52	48	100	0	49
WASHINGTON	PDC	52	14	25	0	14	48	14	50	50	100	0	45
	Comp	61	15	43	2	5	48	3	61	39	100	0	52
WEST VIRGINIA	PDC	38	11	5	0	0	95	0	37	63	100	0	34
	Comp	34	21	15	0	0	85	0	68	32	100	0	27
TOTALS BY GROUP	PDC	572	9	34	25	2	37	2	47	53	91	9	510
	Comp	503	9	38	25	2	35	2	52	48	91	9	459
TOTALS, ALL GROUPS COMBINED		1075	9	36	25	2	36	2	50	50	91	9	969

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[1] The full sample of 1219 for the fall 1976 data collection has been reduced by attrition to 1075. This table describes the characteristics of those remaining--the full testing sample for spring 1977.

Table 2

Summary of Fall-to-Spring Attrition for Cohort 2 in Comparison with Cohort 1

	PDC				COMPARISON			
	Cohort 2			Cohort 1	Cohort 2			Cohort 1
	N_{Fall}	N_{Spr}	% Drop	% Drop	N_{Fall}	N_{Spr}	% Drop	% Drop
California-English	37	31	*16*	*19*	25	21	*16*	*19*
California-Spanish	7	6	*14*		15	11	*27*	
Colorado	55	50	*9*	*10*	32	25	*22*	*7*
Connecticut	56	53	*5*	*11*	57	54	*5*	*2*
Florida	47	39	*17*	*12*	39	35	*10*	*14*
Georgia	46	43	*7*	*15*	--	--	--	--
Iowa	50	43	*14*	*27*	54	48	*11*	*11*
Maryland	44	41	*7*	*8*	58	47	*19*	*7*
Michigan	66	58	*12*	*9*	64	58	*9*	*14*
Texas-English	26	23	*12*	*5*	20	19	*5*	*12*
Texas-Spanish	38	31	*18*		37	36	*3*	
Utah	68	64	*6*	*14*	61	54	*12*	*12*
Washington	58	52	*10*	*13*	76	61	*20*	*11*
West Virginia	46	38	*17*	*17*	37	34	*8*	*1*[illegible]
TOTAL	644	572	*11*	*13*	575	503	*13*	*11*

Table 3

Summary of Attrition, Fall 1976 to Spring 1977

				No. of Children Not Tested Due To:				
	No. in Full Fall 1976 Sample	No. in Full Spring 1977 Sample	Per Cent Departing	Moving, Withdrawn	Continual Absence	Refusal	Change of Groups	Other
PDC	644	572	11	63	2	2	1	4
Comp	575	503	13	67	2	0	1	4
TOTAL	1219	1075	12	130	4	2	2	8

Because of this attrition it is necessary to reassess both the comparability and representativeness of the present PDC and comparison groups to determine whether some imbalance may have been created by the changes in their composition. Comparability refers to how similar or different the remaining PDC and comparison groups are. An analysis of the data collected in fall 1976 showed the two groups to be comparable.[1] However, since a number of children have left the program it is important to again compare the baseline scores for the remaining children to ascertain their comparability at this time point.

Representativeness differs from comparability and refers to how similar or different the remaining PDC and comparison children are to the PDC and comparison children who have left. If the characteristics of the children who left each sample do not differ significantly from the characteristics of those children still remaining then we can conclude that the makeup of the groups has not been affected appreciably by attrition. In other words, the remaining samples are representative of the original groups.

Comparative statistics for the remaining PDC and comparison children in the English-dominant sample are presented in Table 4. Only two differences in fall 1976 scores were found between the groups--the comparison children remaining in the sample scored higher on Verbal Memory-1 and were rated higher on one POCL scale than the remaining PDC children. Table 5, which presents similar statistics for the Spanish-dominant sample, shows significant group differences on four variables--a larger percentage of the remaining comparison children had prior preschool experience, comparison children had more siblings, and PDC children scored higher on the BSM-Spanish and the WPPSI.

Analyses of the representativeness of the remaining children in the English-dominant sample are presented in Table 6. Only three significant differences were found in the PDC group--mothers of children remaining in the program have completed more years of schooling, and departing children scored higher on Verbal Memory-1 and received higher ratings on one of the POCL scales; for the comparison group only the PIPS scores of remaining and departing children differed significantly. Few differences were found in the Spanish-speaking sample, as shown in Table 7: there are no significant differences for the PDC group and only three--on the PIPS and the two POCL scales--for the comparison group.

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[1] See Interim Report VI for more detailed information on comparability of the groups in fall 1976.

Table 4

Comparability of Remaining PDC and Comparison Children on Baseline (Fall 1976) Characteristics (English-Dominant Analytic Sample)

	PDC Sample Spring 1977	Comparison Sample Spring 1977
N (Approximate)	473	415
Background Characteristics		
Ethnicity (%)		
Black	39	42
Hispanic	19	18
American Indian/Native Alaskan	2	2
White	39	37
Asian/Pacific Islander	2	2
Sex (%)		
Male	50	48
Female	50	52
Prior Preschool (%)		
Yes	13	16
No	87	84
Age (Months)	53.62	53.66
No. of Sibs	1.89	1.88
Mother's Education	11.16	11.16
Test Scores (Fall 1976)		
BSM-English	9.35	9.39
WPPSI	4.96	5.20
Verbal Fluency	5.89	6.40
Verbal Memory-1	12.41	13.69*
Verbal Memory-3	2.59	2.70
Arm Coordination	3.43	3.49
Draw-A-Child	3.92	4.07
PIPS	1.97	2.06
POCL-1	32.44	33.73
POCL-2	12.60	13.14*

Note. The patterns of PDC and comparison children's test scores (analyzing all tests jointly) do not differ significantly. (Multivariate $F = 1.47$, $p = .15$.)

*Difference significant with $p < .10$ (two-tailed).

Table 5

Comparability of Remaining PDC and Comparison Children on Baseline (Fall 1976) Characteristics (Spanish-Dominant Analytic Sample)

	PDC Sample Spring 1977	Comparison Sample Spring 1977
N (Approximate)	37	41
Background Characteristics		
Ethnicity (%)		
Black	0	0
Hispanic	100	98
American Indian/Native Alaskan	0	0
White	0	2
Asian/Pacific Islander	0	0
Sex (%)		
Male	60	46
Female	40	54
Prior Preschool (%)		
Yes	11	36
No	89	64*
Age (Months)	55.30	56.67
No. of Sibs	1.83	2.81*
Mother's Education	7.13	6.13
Test Scores (Fall 1976)		
BSM-English	2.47	2.68
BSM-Spanish	13.49	11.57*
WPPSI	8.70	6.98*
Verbal Fluency	4.54	5.16
Verbal Memory-1	13.84	13.52
Verbal Memory-3	2.58	2.25
Arm Coordination	4.41	4.25
Draw-A-Child	4.38	4.70
PIPS	2.05	1.89
POCL-1	28.24	29.32
POCL-2	10.62	11.43

Note. The patterns of PDC and comparison children's test scores (analyzing all tests jointly) do not differ significantly. (Multivariate F = 1.51, p = .16.)

*Difference significant with p < .10 (two-tailed).

Table 6

Representativeness of Remaining PDC and Comparison Children with Respect to Original (Fall 1976) Groups (English-Dominant Analytic Sample)

	PDC		COMPARISON	
	Children Remaining in the Testing Sample	Children Departing from the Testing Sample	Children Remaining in the Testing Sample	Children Departing from the Testing Sample
N (Approximate)	473	57	415	56
Background Characteristics				
Ethnicity (%)				
Black	39	32	42	33
Hispanic	19	18	18	20
American Indian/Native Alaskan	2	0	2	2
White	39	48	37	43
Asian/Pacific Islander	2	2	2	2
Sex (%)				
Male	50	43	48	42
Female	50	57	52	58
Prior Preschool (%)				
Yes	13	12	16	14
No	87	88	84	86
Age (Months)	53.62	53.98	53.66	53.75
No. of Sibs	1.89	1.87	1.88	1.59
Mother's Education	11.16	10.47*	11.15	10.87
Test Scores (Fall 1976)				
BSM-English	9.35	9.49	9.39	10.05
WPPSI	4.95	4.49	5.19	4.73
Verbal Fluency	5.89	6.16	6.40	6.98
Verbal Memory-1	12.40	14.66*	13.69	14.78
Verbal Memory-3	2.59	3.16	2.70	2.50
Arm Coordination	3.42	3.21	3.49	3.63
Draw-A-Child	3.92	3.65	4.07	4.36
PIPS	1.97	2.09	2.06	2.54*
POCL-1	32.43	34.73*	33.37	33.84
POCL-2	12.59	13.52	13.14	12.64

Note. The patterns of remaining vs. departing children's scores (analyzing all tests jointly) do not differ significantly. (For PDC children, Multivariate F = 1.00, p = .44; for comparison children, Multivariate F = 1.08, p = .38.)

*Difference significant with p < .10 (two-tailed).

Table 7

Representativeness of Remaining PDC and Comparison Children with Respect to Original (Fall 1976) Groups (Spanish-Dominant Analytic Sample)

	PDC		COMPARISON	
	Children Remaining in the Testing Sample	Children Departing from the Testing Sample	Children Remaining in the Testing Sample	Children Departing from the Testing Sample
N (Approximate)	37	8	44	5
Background Characteristics				
Ethnicity (%)				
Black	0	0	0	0
Hispanic	100	100	98	100
American Indian/Native Alaskan	0	0	0	0
White	0	0	2	0
Asian/Pacific Islander	0	0	0	0
Sex (%)				
Male	60	71	46	20
Female	40	29	54	80
Prior Preschool (%)				
Yes	11	13	36	60
No	89	87	64	40
Age (Months)	55.29	55.14	56.67	54.60
No. of Sibs	1.83	2.50	2.80	2.40
Mother's Education	7.13	6.50	6.13	7.40
Test Scores (Fall 1976)				
BSM-English	2.46	1.0	2.68	4.66
BSM-Spanish	13.48	12.14	11.56	13.20
WPPSI	8.70	8.37	6.97	6.00
Verbal Fluency	4.54	3.16	5.15	7.00
Verbal Memory-1	13.83	12.75	13.52	12.40
Verbal Memory-3	2.58	2.25	2.25	1.80
Arm Coordination	4.40	5.38	4.25	3.57
Draw-A-Child	4.37	4.66	4.70	4.00
PIPS	2.05	1.16	1.88	3.00*
POCL-1	28.24	32.12	29.31	40.00*
POCL-2	10.62	12.25	11.43	16.40*

Note. The patterns of remaining vs. departing children's scores (analyzing all tests jointly) do not differ significantly. (For PDC children, Multivariate F = 0.65, p = .76; for comparison children, Multivariate F = 0.88, p = .56.)

*Difference significant with p < .10 (two-tailed).

To restate these findings in capsular form, then, the PDC and comparison groups are still comparable and each group remains representative of the larger original sample.

Characteristics of the Instruments in the Basic Battery

Reliability

Internal consistency (Cronbach's alpha) coefficients were computed for all the measures in the basic battery except the PIPS (which does not vary internally since it consists of a single composite item). All these coefficients met the internal consistency criterion--a value of .65 or higher--that has been applied in past analyses of test characteristics. Stability (test-retest) coefficients were also computed for all the measures administered in both fall and spring. No criterion value has been established for stability coefficients, but they are shown in Table 8, alongside the internal consistency statistics, for purposes of documentation.

Sensitivity to Change

Since the impact study depends on the child measures to detect any changes that PDC may produce in PDC children, it is imperative that the measures included in the battery actually be sensitive to change. None of the tests now in the battery were found deficient in sensitivity last year, in analyses of fall-spring data from Cohort 1. (Cohort 1 was the sample of children who preceded this year's sample, Cohort 2.) Nevertheless, the analyses were repeated for this year's sample of children to verify that the same test characteristics hold for them as held for their predecessors. Two sets of analyses were performed: the first examined the significance of the increase in scores for each test from fall to spring; the second, examined the significance of the difference between spring scores and predicted spring scores. Predictions were based upon estimates of maturation effects, which were determined by examining the relationship between age and test performance for this sample of children in the fall.[1] In the first set of analyses, spring scores were expected to be greater than fall scores--the difference amounts

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[1] A more detailed description of these analyses can be found in Interim Report IV, Volume 1. Pilot Year Impact Study: Instrument Characteristics and Attrition Trends, August 1976.

Table 8

Internal Consistency (Cronbach's Alpha) and Stability (Test-Retest Correlation) of the Child Measures Spring 1977 Analytic Sample

	Internal Consistency				Stability			
	English-Dom.		Spanish-Dom.		English-Dom.		Spanish-Dom.	
Measures	N	α	N	α	N	r_{tt}	N	r_{tt}
COGNITIVE-LANGUAGE								
BSM-ENGLISH	884	.83	15	.90	883	.71	13	.90
BSM-Spanish	16	.94	79	.70	--	--	75	.59
WPPSI	352	.81	--	--	351	.62	--	--
Verbal Fluency	887	.76	81	.76	872	.49	81	.52
Verbal Memory-1	887	.82	81	.85	884	.51	81	.69
Verbal Memory-3	882	.81	81	.78	871	.47	80	.39
Draw-A-Child	883	.81	81	.69	873	.54	81	.39
PSYCHOMOTOR								
Arm Coordination	887	.69	81	.71	870	.43	79	.24
SOCIAL-EMOTIONAL								
PIPS[a]	--	--	--	--	873	.38	81	.17
POCL-1: *Task Orientation*	830	.95	77	.94	830	.44	77	.39
POCL-2: *Sociability*	830	.87	77	.90	830	.43	77	.39
CRS-1[b,c]: *Friendliness*	753	.85	--	--	--	--	--	--
CRS-2[b,c]: *Aggressiveness*	753	.84	--	--	--	--	--	--
CRS-3[b,c]: *Perseverance*	753	.89	--	--	--	--	--	--
CRS-4[b,c]: *Independence*	753	.77	--	--	--	--	--	--
CRS-5[b,c]: *Self-Assurance*	753	.91	--	--	--	--	--	--
CRS-6[b,c]: *Resourcefulness*	753	.74	--	--	--	--	--	--

[a] Consists of a single composite item, thus internal consistency coefficient cannot be computed.

[b] Not completed for a sufficient number of Spanish-dominant children to permit computation of alpha.

[c] Not administered in fall, thus no test-retest coefficient.

to a simple measure of gain. In the second set of analyses, actual spring scores were expected to be equal to or greater than predicted spring scores--the logic is that children's performance should have improved by at least the amount due to maturation, and perhaps more if Head Start enhances their performance.

These analyses were performed for the English-dominant sample only, since the small size of the Spanish-dominant sample does not permit the manipulations involved. All of the child measures except the POCL and Child Rating Scale were included in the analyses. (Although the ratings produced by the POCL were expected to change from fall to spring, they weren't expected to do so in a consistent up-or-down direction, and the Child Rating Scale is administered only in spring.)

Fall-to-spring change: criterion of simple gain. Table 9 shows the fall and spring means on measures for the English-dominant group (combining treatment groups), and the t statistic for the differences between means. All of the measures showed a significant fall-to-spring increase, indicating that they are sensitive to change in some degree.

Fall-to-spring change: criterion of expected gain. For each of the measures, an expected spring score was calculated based on fall score, age, and status on background variables (sex, ethnicity, prior preschool experience, mother's education, number of siblings, and number of adults in the home). The means of these expected spring scores are shown in Table 10, along with the actual spring means and the t statistics for differences between means. For all the measures except BSM-English the actual spring mean was greater than the expected mean; in other words, the children gained more on the measures than was expected on the basis of maturation. For all the measures except Arm Coordination, more than half the children obtained an actual spring score that was greater than or equal to their expected spring score. These results indicate that, in general, the tests are sensitive to change that is produced by factors beyond maturation. School experience is the most plausible extra factor.

Summary of sensitivity to change. All of the instruments examined did reflect fall-to-spring gains in the performance of the children tested. Furthermore, all but one reflected gains that seem attributable to school experience, acting beyond the effect of maturation. For the span of the Head Start year, then, the sensitivity property of all these instruments is deemed acceptable.

Table 9

Sensitivity of Measures to Change: Differences Between Fall 1976 and Spring 1977 Scores for English-Dominant Sample

	N	Fall Mean	Spring Mean	Pairwise t Statistic
BSM-English	780	9.41	10.33	8.08*
WPPSI	323	5.45	8.65	16.07*
Verbal Fluency	771	6.04	9.22	16.50*
Verbal Memory-1	781	12.84	15.10	9.88*
Verbal Memory-3	771	2.63	3.95	13.46*
Arm Coordination	770	3.43	4.46	8.51*
Draw-A-Child	772	4.04	5.63	17.32*

*Differences significant with $p < .05$, directional probability.

Table 10

Sensitivity of Measures to Change: Differences Between Actual and Predicted Spring 1977 Scores for the English-Dominant Children

	N	Predicted Spring Mean	Actual Spring Mean	Pairwise *t* Statistic	% of Children Whose Actual Spring Score > Projected Spring Score
BSM-English	772	10.48	10.35	-1.09	54
WPPSI	320	6.94	8.61	7.15*	58
Verbal Fluency	763	7.93	9.21	6.49*	57
Verbal Memory-1	773	14.47	15.10	2.79*	58
Verbal Memory-3	763	3.50	3.93	4.52*	60
Arm Coordination	762	4.16	4.45	2.48*	44
Draw-A-Child	764	5.19	5.64	5.14*	61

*Difference significant with $p < .05$, directional probability.

Factor Structure of the Battery

Factor analyses were performed to investigate the interrelationships among child measures in the spring 1977 battery. These analyses were done separately for the English-dominant sample and the Spanish-dominant sample. For the English-dominant sample the analysis yielded four distinct factors, as shown in Table 11, which account for 91.2% of the variance among the measures. The analysis for the Spanish-dominant sample yielded two factors (see Table 12) which account for 64.4% of the variance.

The factor structures are similar for both groups when the Child Rating Scale is overlooked. For the English-dominant sample the Child Rating Scale generally loads on one factor (that accounts for 33.1% of the variance) while the tests (excluding Arm Coordination) load on another factor (that accounts for 20.6% of the variance). Both of the POCL factors load with one of the Child Rating Scale factors, "Aggressiveness," on a third factor (that accounts for 24.3% of the variance). Arm Coordination and the CRS factor "Independence" load on a separate factor.

For the Spanish-dominant sample all of the tests except Arm Coordination also load on a single factor (that accounts for 26.5% of the variance) while the two POCL factors along with Arm Coordination load on the second factor. Thus, for both samples, the child measures seem to be tapping the same dimension while Arm Coordination seems to be tapping another dimension. Also, for both samples, the two POCL factors load on a non-test factor.

Relationships of Tests to Social Competence

Since the PDC battery was constituted with the intent of providing for measurement of the traits that comprise social competence, an analysis was performed that examined the relationships of the spring 1977 test scores to *ad hoc* criteria of social competence. The social competence of children in the sample was represented by measures extracted from the PDC Child Rating Scale (CRS) and the POCL, instruments used by classroom teachers and testers respectively to rate the child on a variety of dimensions, e.g., "Has the desire to master all kinds of skills;" "Is Active...Passive." The measures produced by these two instruments were selected as proxy "social competence" criteria because the assessments provided by the teacher and tester are based upon observations of each child's behavior in a variety of formal and informal situations, and this logically comes close to representing measures of the child's "everyday effectiveness," i.e., social competence.

Table 11

Factor Analysis[a] of Scores on Child Measures
English-Dominant Head Start Children
Spring 1977 Data

(N = 692)

	Factor Loadings of Child Measures *(highest loading of each italicized)*			
Child Measure	Factor 1	Factor 2	Factor 3	Factor 4
BSM-English	*.65*	.04	-.09	-.27
Verbal Fluency	*.74*	.16	.12	.04
Verbal Memory-1	*.67*	.02	.12	.04
Verbal Memory-3	*.65*	.05	.29	.00
Arm Coordination	.12	.11	.00	*.81*
Draw-A-Child	*.63*	.19	-.08	.15
PIPS	*.63*	.06	.10	.02
POCL-1: *Task Orientation*	.53	.19	*.54*	-.06
POCL-2: *Sociability*	.26	.06	*.82*	-.16
CRS-1: *Friendliness*	.09	*.81*	.03	-.01
CRS-2: *Aggressiveness*	-.02	-.09	*.67*	.27
CRS-3: *Perseverance*	.21	*.83*	-.15	-.03
CRS-4: *Independence*	-.13	-.43	.09	*.47*
CRS-5: *Self-Assurance*	.09	*.89*	.20	.04
CRS-6: *Resourcefulness*	.06	*.84*	.01	.01

[a] Principal components solution, varimax rotation.

Table 12

Factor Analysis[a] of Scores on Child Measures Spanish-Dominant Head Start Children

Spring 1977 Data[b]
(N = 75)

	Factor Loading of Child Measures *(highest loading italicized)*	
Child Measure	Factor 1	Factor 2
BSM-Spanish	*.56*	.42
Verbal Fluency	*.73*	.07
Verbal Memory-1	*.58*	.46
Verbal Memory-3	*.52*	.42
Arm Coordination	.21	*.41*
Draw-A-Child	*.70*	-.06
PIPS	*.57*	.23
POCL-1: *Task Orientation*	.21	*.86*
POCL-2: *Sociability*	-.07	*.86*

[a] Principal components solution, varimax rotation

[b] The Child Rating Scale was not completed in the Texas site and thus not included in the analysis.

The first step in the analysis was to cluster the 39 items of the CRS into subscales, on the basis of factor analysis. (POCL subscales are predefined.) Table 13 describes the factors that emerged from the analysis; each item is listed under the factor on which it loaded highest. (The labels assigned to the factors represent what appear to be the common features of the items contributing most heavily to each.) Next, factor scores were created by summing each child's score on those items associated uniquely with each factor. The six resulting CRS factors and the two POCL factors were then taken as representing "social competence" for purposes of this analysis. It is interesting to note at this point that the six CRS factors produced with the current data are comparable to the five factors found in the spring 1976 CRS data.[1] The items that loaded highest on two factors ("Perseverance" and "Self-Assurance") were almost the same across the two data sets while on the other four factors there were many similarities in item loadings. The resemblance between the factor structures found for the two samples indicates that the subscales of the CRS are stable and independently meaningful.

Statistical relationships of test scores to "social competence" criteria. To examine these relationships, each of the PDC tests was regressed on the eight "social competence" criteria and on three background variables (ethnicity, sex, and age). The object of the analysis was to determine how fully the test score could be predicted from knowledge of all these variables, and particularly to determine the contribution of "social competence" criteria to this prediction beyond what could be predicted simply from knowledge of the child's status on the background variables. The better the prediction permitted by the criteria, the greater the apparent relevance of the test to social competence. Table 14 displays the findings for each test.

For these Head Start children, all of the major tests were significantly predicted from the "social competence" criteria. Among these, Verbal Memory-3 and Verbal Fluency showed the strongest relationship to the criteria: about 20% of the variance in each of these tests was predictable from knowledge of "social competence" status. The single variable most strongly related to these two scores is the POCL factor labeled "Task Orientation." In fact, this POCL factor is the strongest predictor for six of the eight child tests. The most consistently significant predictors of test scores, along with POCL-1, were age, ethnicity and CRS-3 ("Perseverance").

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[1] For greater detail, see Interim Report IV, Volume 1, August 1976.

Table 13

Item Clusters Produced by Factor Analyses of the PDC Child Rating Scale

Factor Loading	CRS-1: "Friendliness
+.54	9. Cooperates and shares with others
.82	10. Shows verbal affection to others
.80	12. Shows physical affection to others
.48	15. Shows awareness of and pride in own culture
.58	21. Shows respect or tolerance of others' ideas or behavior or looks
.60	22. Recognizes others' feelings, responds appropriately
	CRS-2: "Aggressiveness" (negative-loading items reversed)
.71	1. Uses words or wits to try to influence others
.67	2. Uses physical force to try to control others
.74	3. Succeeds in influencing or controlling others
.72	6. Competes with others for toys, attention, achievement
.69	7. Asserts his/her rights to fair treatment
-.48	8. Accepts or abides by school, classroom rules
.65	11. Shows verbal dislike or hostility to others
.61	13. Shows physical dislike or hostility to others
	CRS-3: "Perseverance" (negative-loading items reversed)
.48	26. Uses alternative strategies if initial problem-solving methods fail
-.72	27. Is easily distracted when doing a task
-.72	29. Asks for unnecessary help to do a task
.63	30. Sees his/her errors in a task and corrects them
-.73	31. Gives up on tasks before they are finished
.67	32. Returns to unfinished tasks after interruption
-.73	35. Chooses tasks that are too easy for him/her
.57	38. Has a desire to master all kinds of skills
-.57	39. Needs much encouragement and material rewards to attempt tasks
	CRS-4: "Independence" (negative-loading items reversed)
-.83	4. Is controlled or influenced by others
-.84	5. Imitates others or follows them around

Table 13

Item Clusters Produced by Factor Analyses of the PDC Child Rating Scale (Continued)

Factor Loading	CRS-5: "Self-Assurance
.43	14. *Shows self-confidence*
.42	16. *Decides for self what to do, with whom to play*
.41	20. *Takes on the role of adult during dramatic play*
.63	23. *Talks freely to children*
.60	24. *Talks freely to adults*
.44	25. *Works or plays well on his/her own*
.80	33. *Enjoy tasks he/she chooses*
.81	34. *Shows pride in what he/she does or makes*
.52	37. *Expects to succeed, not afraid of failure*
	CRS-6: "Resourcefulness"
.59	17. *Gets the attention of adults appropriately*
.56	18. *Gets the attention of peers appropriately*
.45	19. *Attempts to solve social problems with little adult assistance*
.62	28. *Asks for needed help to do a task*

Table 14

Relationships of "Social Competence" Criteria and Background Variables to Test Scores of Head Start Children

Test	% variance accounted for jointly by "social competence" criteria & background variables	% variance accounted for by "social competence" criteria beyond background variables	Significant predictors ($p \le .05$) & their partial correlations with test scores	
			Variable	Partial
BSM-English *(N = 689)*	.27*	.07*	Ethnicity	-.40
			CRS-6	-.15
			POCL-1	.13
			Age	.13
			CRS-3	.12
			CRS-4	-.08
WPPSI *(N = 307)*	.21*	.17*	POCL-1	.19
			CRS-3	.17
			Age	.16
Verbal Fluency *(N = 689)*	.27*	.19*	POCL-1	.31
			Age	.17
			Ethnicity	-.12
			CRS-3	.12
			CRS-2	.11
Verbal Memory-1 *(N = 689)*	.16*	.13*	POCL-1	.25
			CRS-6	-.08
Verbal Memory-3 *(N = 689)*	.23*	.20*	POCL-1	.32
			Ethnicity	-.08
Arm Coordination *(N = 689)*	.16*	.03*	Sex	-.24
			Ethnicity	.18
			Age	.18
			POCL-1	.12
			CRS-4	.08
Draw-A-Child *(N = 689)*	.22*	.11*	POCL-1	.23
			Sex	.18
			CRS-3	.18
			Age	.16
PIPS *(N = 689)*	.16*	.12*	POCL-1	.27
			Ethnicity	-.12
			Age	.09

*probability of associated F ratio $\le$ .001.

KEY:

POCL-1: "Task Orientation"
CRS-2 : "Aggressiveness"
CRS-3 : "Perseverance"
CRS-4 : "Independence"
CRS-6 : "Resourcefulness"

Comparison with previous regression analysis. These results are comparable with the spring 1976 analysis in two respects. First, in both cases, the "social competence" criteria significantly predicted test scores for all or most of the child measures. However, the proportion of variance in the social competence variables accounted for this year was somewhat lower than in spring 1976 for all the tests--appreciably lower for the BSM-English (7% vs. 17%) and the PIPS (12% vs. 37%). Second, the variables found to be significant predictors are similar. Both last year and this year the POCL factor, "Task Orientation," and the CRS factor, "Perseverance," were consistently significant predictors for many of the tests. This time, with the larger sample, two of the background variables--ethnicity and age--were more often significant predictors of test scores than was the case with the spring 1976 data. One difference between the 1976 and 1977 results involves the Arm Coordination measure. In 1976 none of the "social competence" variables were found to be significant predictors of Arm Coordination scores, while this year's data show both POCL-1 ("Task Orientation") and CRS-4 ("Independence") to be significant predictors.

On the whole, though, the current findings replicate the spring 1976 findings and confirm the notion that the tests provide measures that are empirically relevant to social competence, or to our best approximation of that construct.

Characteristics of Supplemental Instruments

Classroom Observation System

Summary of past findings. In 1975-76, observers reported that the Classroom Observation System could be used in the field with little difficulty, and spring 1976 reliability assessments indicated acceptable levels of accuracy. Analyses of 1975-76 data demonstrated relationships between children's observed social skills and their performance on other measures in the PDC battery. But in view of the low magnitude of these relationships, particularly with regard to teachers' ratings of similar dimensions of behavior, it was concluded that the validity of the instrument as a measure of social skills has not been adequately established.

In part, the validity problem may be attributable to the way in which behaviors were sampled. Since the activity level of the classroom (i.e., opportunity for social interactions) was found to be highly related to children's behaviors, it seemed likely that the 20-minute observation period provided a description of the child's behavior under only one particular classroom condition. Under other conditions, the child's behavior might have been very different from that sampled. For this reason, it was decided to regard the observation system as a measure of classroom "personalities," rather than individual behaviors, and to use it for assessing PDC impact at the classroom level. Analyses of fall 1976 observation data corroborated the previous year's findings and supported the classroom-level use of the observation system.

Analyses of spring 1977 data. The purpose of the spring 1977 analyses was to further substantiate the use of the observation instrument as a measure of classroom characteristics. Two types of reliability assessments are important in this process.

First, because observers did not receive extensive retraining before collecting spring 1977 observation data, it was important to assess the accuracy of the observers' observations and coding procedures. Thus, as in past analyses, coding reliability data were collected and analyzed for this report.

Second, because the PDC observation instrument is potentially a measure of program impact and change, it is important to assess whether the instrument accurately represents, and thus reliably measures, characteristics of the classroom. One method of assessing this reliability is to test the stability of observed classroom behavior.

Another way of assessing the validity of observation data is to assess relationships with other measures in the PDC battery. In this analysis, the issue becomes one of concurrent validity. If observation data accurately represent classroom behavior, then children's observed social skills should be related to their performance on other measures in the PDC battery that assess similar dimensions of children's behavior. Classroom-level analyses were thus conducted which examined these relationships by correlating observation variables with other child measures.

Observation data were prepared for analysis by summing each child's behavioral incidents across the 10-minute observational interval and then averaging these scores across children within classrooms, creating a classroom score for each category. These summary scores were, in turn, converted into rates of occurrence. Thus, a classroom's score on a particular observation variable represents the number of times a behavior occurred relative to the number of possible occurrences, i.e., the score represents relative frequency. The spring 1977 means and standard deviations of these transformed variables are shown in Table 15.

Observer accuracy. Data on accuracy of coding were collected shortly after the observers had completed the spring 1977 onsite training session to determine how well prepared observers were to begin their observations. To assess this, observers simultaneously watched and independently coded a 40-minute videotape which included several clear examples of the behavioral categories contained in the observation system.[1]

Accuracy of coding was assessed by comparing each observer's responses to a criterion coding of the same behavioral events, yielding a measure of how well observers' codes matched the criterion for the total length of a given observation period. To obtain this estimate of agreement, the total number of tallies assigned to a given category by an observer was divided by the total number of tallies assigned to that category in the criterion coding. The index thus produced is not a conventional measure of inter-observer agreement, but an assessment of "accuracy," since all observers are judged against a single criterion. The analysis provides a basis for identifying those categories that were commonly coded unreliably by a majority of the observers.

Table 16 presents the mean proportion of agreement for each category of the Observation System. Also included in this table is an indication of whether observers overestimated or underestimated the frequency of a specific category of behaviors.

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[1] Due to difficulties in obtaining video equipment, the observers from California and Texas did not participate in this onsite coding reliability assessment.

Table 15

Classroom-Level Means and Standard Deviations of Observation Categories

Spring 1977

Observation Category	Mean	Standard Deviation
Classroom Involvement		
Noninvolved	.07	.08
Social	.48	.11
Nonsocial	.44	.12
Classroom Verbal Behavior		
Verbal English	.40	.15
Verbal Spanish	.04	.10
Verbal Combination	.07	.01
Nonverbal	.57	.13
Description of Child-Peer Interactions		
Negative	.01	.02
Positive Control	.16	.09
Positive Assert	.03	.03
Other Positive Behaviors	.80	.10
Frequency of Interaction	.54	.12
Purpose of Child-Peer Interactions		
Requests Information	.05	.03
Gives Information	.25	.09
Requests Assistance	.08	.05
Gives Assistance	.09	.01
Requests Support	.01	.01
Gives Support	.01	.01
Description of Child-Adult Interactions		
Negative	.00	---
Positive Control	.13	.08
Positive Assert	.01	.01
Other Positive Behaviors	.86	.08
Frequency of Interaction	.43	.12
Purpose of Child-Adult Interactions		
Requests Information	.04	.04
Gives Information	.21	.11
Requests Assistance	.05	.05
Gives Assistance	.09	.11
Requests Support	.01	.00
Gives Support	.00	.02

Table 16

PDC Observation Instrument
Spring 1977 Coding Reliability
and Fall-Spring Stability

Observation Category	Number of Examples	Proportion of Agreement	Direction of Error[1]	Stability Coefficient (N=80)
Classroom Involvement				
Noninvolved	6	.92	+	.12
Social	13	.99	-	.44*
Nonsocial	110	.97	-	.22*
Classroom & Verbal Behavior				
Verbal English	84	.98	-	.62*
Verbal Spanish	0			.89*
Verbal Combined	0			.62*
Nonverbal	39	.99	+	.50*
Child-Peer Interactions				
Negative	9	.79	-	.48*
Positive Control	22	.94	-	.47*
Positive Assert	8	.86	-	.17
Other Positive Behaviors	26	.97	+	.47*
Requests Information	6	.98	-	.12
Gives Information	10	.70	+	.04
Requests Assistance	22	.60	-	-.11
Gives Assistance	10	.84	+	.48*
Requests Support	7	.70	+	.05
Gives Support	3	.75	-	.12
Other Purposes	7	.88	-	.16
Child-Adult Interactions				
Negative	5	.54	-	-.01
Positive Control	22	.97	-	.29*
Positive Assert	8	.64	-	.03
Other Positive Behaviors	15	.74	+	.31*
Requests Information	7	.90	+	.17
Gives Information	9	.90	+	.28*
Requests Assistance	11	.82	-	-.01
Gives Assistance	5	.86	-	.46*
Requests Support	9	.70	-	.36*
Gives Support	1	.63	-	-.03
Other Purposes	8	.80	+	.23*

[1] Overestimates and underestimates of individual categories are represented respectively by plus and minus signs.

*$p < .05$

As has been found in past coding of reliability analyses, observers can accurately distinguish and code children's involvement in the classroom (Noninvolved, Social, and Nonsocial).[1] Proportions of agreement in these categories ranged from .92 to .99, with a mean of .96. High agreement figures were also evident in the categories describing verbal behavior (Verbal English and Nonverbal).

Lower proportions of agreement marked categories of behavior during child-peer and child-adult interactions. Proportions of agreement in these categories ranged from .54 to .98, with a mean of .80 (slightly lower than the fall 1976 reliabilities). Although these reliabilities may be acceptable considering the fine behavioral distinctions observers are required to make and the fact that observers did not receive extensive training prior to this reliability assessment, findings from the analysis of categories with proportions of agreement less than .80 should be considered tentative.

Stability of observation data. An analysis of the stability of classroom-level mean relative frequences was conducted by correlating the fall 1976 and spring 1977 scores from 80 PDC and comparison classrooms for which complete data were available. Although one might expect many events to intervene during this interval to alter the character of classrooms, thus lowering the correlations, the analysis nevertheless provides a rough indication as to whether the observation categories tend to rank the classrooms in the same manner at each time point.

The correlations obtained in this analysis are presented in the right-hand column of Table 16. The categories of verbal behavior produced the highest correlations (.50 to .89), and four of the child-peer interaction categories had correlations of almost .50. The categories of child-adult interaction had generally lower stability coefficients.

Relationships between classroom behavior and other child measures. In examining the relationship between observation variables and other child measures, classroom means were first computed for the child tests and PDC Child Rating Scale factors, and then correlated with the observation variables.[1] As shown in Table 17, the relationships found ranged from moderately negative to moderately positive. Consistent with past analyses, observation categories that occurred more frequently tended to show higher correlations with other variables. For example, rate of peer interaction was positively related to scores on the BSM, PIPS, and Child Rating Scale factors. In addition, rate of verbal behavior in the classroom was positively related to children's scores on the BSM; rate of nonverbal behavior was negatively related to scores on both the BSM and Draw-A-Child.

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[1] Definitions and examples of the observation categories can be found in Interim Report VI, Appendix F (March, 1977) and in the PDC Observation System Manual (Fall 1976).

Although behavior in the individual categories describing peer and adult interactions occurred less frequently, some of these categories were also moderately related to other child measures. For example, rate of requesting assistance from a peer in the classroom was positively related to scores on three factors of the Child Rating Scale, and rate of requesting information from a peer was positively related to scores on the BSM and Draw-A-Child. It appears that the purpose of children's interactions with their peers (i.e., to request information or assistance) is related to a wide range of children's cognitive, language, or social competencies.

The findings from this analysis are supportive of findings from past correlational analyses. Classroom interaction patterns, particularly those that occur more frequently, are related to children's performance on cognitive, language, and psychomotor measures. These patterns of classroom behavior are also related to teachers' ratings of similar dimensions of children's behavior on the PDC Child Rating Scale. Since higher degrees of association were found for those categories describing more global characteristics of the classroom (e.g., Involvement, Verbal Behavior, Rate of Peer Interaction), greater confidence can be placed in the findings based on these categories.

Impact analysis. The impact of PDC on classroom characteristics was assessed by using analysis of covariance to compare the PDC (N=41) and comparison (N=39) classrooms on the spring relative frequencies. The observation categories displayed in Table 17 were included in the covariance analyses,

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[1] Correlation coefficients between observation variables and child tests were computed using only those classrooms in which a majority of the children spoke English (N=72). Correlation coefficients between observation variables and the PDC Child Rating Scale factors were computed using those classrooms with complete data on the PDC Child Rating Scale (N=69).

Table 17

Correlations of Classroom Means on Observation Variables and Other Child Measures[a,b]

Spring 1977

	Classroom Involvement			Verbal Behavior		Descriptors of Peer Interactions					Purpose of Peer Interactions				Descriptors of Adult Interactions					Purpose of Adult Interactions			
	Noninvolved	Social	Nonsocial	English	Nonverbal	Frequency of Interaction	Positive Control	Positive Assert	Other Positive Behaviors	Negative Behaviors	Requests Information	Gives Information	Requests Assistance	Gives Assistance	Frequency of Interaction	Positive Control	Positive Assert	Other Positive Behaviors	Negative Behaviors	Requests Information	Gives Information	Requests Assistance	Gives Assistance
Arm Coordination	-.23	.14	.03	-.09	.09	.24	.15	-.05	-.12	.04	-.27	.06	-.01	.16	-.22	-.17	-.36	.25	-.02	-.17	.12	-.13	.26
BSM-English	.21	.01	-.16	.41	-.43	.24	.30	.31	-.34	-.05	.25	.17	.11	-.33	-.19	.17	.22	-.21	-.10	.22	-.07	-.01	-.44
Draw-A-Child	-.15	.06	.05	.21	-.26	.22	.29	.15	-.27	-.11	.33	.08	-.02	-.20	-.24	.00	.10	-.03	-.17	.16	.10	-.15	-.19
PIPS	.07	.04	-.09	.10	-.09	.26	-.14	-.07	.15	-.10	.14	-.05	.01	-.19	-.28	-.19	-.04	.19	-.04	-.08	-.34	-.01	-.30
POCL-1	-.29	-.07	.26	.09	-.11	.32	-.04	-.12	.09	-.21	.04	-.02	-.18	.15	-.33	-.07	-.01	.07	-.10	.03	.03	-.21	.07
POCL-2	-.41	-.04	.31	-.02	.00	.09	.09	.03	-.07	-.14	.04	-.11	-.19	.22	-.09	.10	.12	-.12	-.14	.11	.03	-.07	-.04
POCL-Total	-.34	-.08	.29	.07	-.08	.27	.00	-.08	.06	-.20	.04	-.04	-.19	.17	-.29	.03	.02	.02	-.12	.05	.03	-.19	.04
Verbal Fluency	.02	.19	-.21	.02	.00	.27	-.03	-.05	.05	-.09	.18	-.08	.01	-.25	-.30	-.06	.15	.02	-.17	.15	-.23	-.09	-.31
Verbal Memory-1	-.03	.31	-.26	.00	-.02	.30	.08	.01	-.05	-.18	.22	-.02	-.01	-.25	-.36	-.10	.08	.08	-.13	-.08	-.07	-.03	-.30
Verbal Memory-3	-.02	.21	-.22	.11	-.12	.36	-.05	-.20	.10	-.05	.19	.07	.10	-.22	-.40	-.16	.00	.15	.00	.02	-.04	-.18	-.10
WPPSI Block Design	-.28	.30	-.14	-.32	.32	.01	-.32	-.09	.30	-.08	-.37	.01	.24	-.31	-.08	-.31	.13	.23	.00	-.35	.12	-.17	-.01
CRS-1[c]	-.11	.23	-.13	.02	-.01	.36	.00	-.27	.09	-.08	.00	-.10	.37	-.16	-.35	.06	.10	-.09	-.04	.08	-.19	.00	.02
CRS-2	-.45	.14	.19	-.15	.15	.05	-.06	.00	.06	-.07	-.07	-.16	-.32	.24	-.14	.02	-.16	.02	-.08	.12	-.14	.03	.19
CRS-3	-.11	-.19	.24	-.05	.04	-.34	-.08	.17	.00	.11	-.17	.01	-.40	.26	.35	.00	-.23	.05	.02	-.04	.16	.13	-.13
CRS-4	-.15	.28	-.15	-.09	.10	.26	-.07	-.26	.15	-.08	-.14	-.14	.39	-.14	-.29	.11	.07	-.12	-.08	.03	-.10	.10	.07
CRS-5	-.10	.17	-.09	-.04	.05	.24	-.10	-.35	.19	.03	-.02	-.05	.34	-.11	-.24	.05	.08	-.06	-.02	-.04	.01	-.02	.10
CRS-Total	-.17	.29	-.14	-.04	.06	.37	-.02	-.29	.12	-.10	-.01	-.13	.36	-.14	-.40	.07	.11	-.09	-.07	.07	-.13	-.01	.04

[a] Correlation coefficients between observation variables and child tests were computed using only those classrooms in which a majority of the children spoke English (N=72). Correlation coefficients between observation variables and Child Rating Scale Factors were computed using those classrooms with complete data on these measures (N=69).

[b] For correlations with CRS, $r_{.05}=.23$; for all other correlations, $r_{.05}=.22$.

[c] The Child Rating Scale subscales that entered into this analysis represented a preliminary configuration of CRS items. Analyses of the CRS presented elsewhere in this report are based on reconfigured subscales. Here, CRS-1="Task Orientation," CRS-2="Sociability," CRS-3="Dependency," CRS-4="Maturity," and CRS-5="Social Ease."

with the fall 1976 relative frequency for each category entered as the covariate in the analysis of the respective spring category. In no case was a significant group effect found. Although there were some apparent differences between groups in their unadjusted spring means, when fall levels of the variables were taken into account, the differences disappeared. Thus, as with most of the child tests and ratings, classroom-level observation data support the conclusion that PDC and comparison Head Start programs produce virtually the same impact.

Preschool Productive Language Assessment Task (PPLAT)

Language proficiency is a particularly important goal for many early childhood education programs. Standardized measures of language, such as the Illinois Test of Psycholinguistic Abilities or the Peabody Picture Vocabulary Test, have been criticized for a number of reasons, including the artificial context that is created for eliciting children's language. The PDC battery lacked any measure of language proficiency collected in a naturalistic manner.

In 1975 it was decided to begin working toward a language measure for the PDC evaluation that would be responsive to the program goals and to the need for a more naturalistic assessment. The Preschool Productive Language Assessment Task (PPLAT), which had been under development at High/Scope, was selected for pilot testing in spring 1976; modifications were made in administration and scoring procedures, and it was administered again in spring 1977. A report on the rationale and development of the PPLAT, a description of the instrument and the language variables it yields, and methodological findings from these two administrations are presented in Appendix B. In this section of the report, a summary of these procedures and findings is presented.

The language-eliciting situation. Children are provided with a variety of materials (novel toys amenable to mechanical exploration and socio-dramatic play, familiar construction and art materials, a Playskool bus, and so on) and interact informally with the adult tester for about 30 minutes. After an initial warm-up period (during which language is not scored) the tester uses a variety of prompts to elicit language from the child. The tester also uses ample acknowledgements and repetitions to encourage expanded discourse.

Data collection and analysis. The entire session is tape-recorded and later transcribed for coding. Coding is done according to the categories described in Appendix B. In spring 1976, PPLAT data were collected from 50 children at two PDC sites; in 1977, it was decided to test all Spanish- and English-speaking children at the Texas site, since information on the PPLAT as a bilingual measure of language proficiency would be particularly useful for the PDC evaluation. The results summarized here are based on analyses of data from both data collection efforts; details of all findings summarized here are presented in Appendix B.

Key findings. The internal consistency of some of the key language variables was examined by correlating scores obtained from the first 50 units of child language (called S-units in this study) in the language sample with scores from the last 50 units. The Spearman-Brown formula was then used to predict the part-part correlations that would be obtained with larger language samples. For some variables it was found that samples of 150 S-units would be sufficiently large to give internally consistent findings; for other variables larger language samples may be needed. This finding has implications, of course, for the cost of collecting language data.

Fifteen children who were deemed truly bilingual were administered the PPLAT in both Spanish and English at the Texas site in spring 1977, about one month before receiving the remainder of the PDC battery. Significant correlations (ranging from .59 to .67) were found for three variables on the scores children obtained in the English and Spanish versions. This suggests that, in terms of some dimensions at least, language measures can be consistent across language groups. In comparing language variables that demonstrate this consistency with those that do not, it appears that those relating to more general cognitive skills remain consistent whether the child is speaking English or Spanish, whereas those relating to vocabulary diversity may be a function of language-specific experiences.

Concurrent validity was examined by correlating PPLAT variables with scores from other measures in the basic child battery. For both Spanish- and English-speaking children, a measure of vocabulary diversity from the PPLAT correlated significantly with the BSM score. These correlations were not so high, however, as to suggest that the two measures are redundant (r = .54 for the English-language sample and .30 for the Spanish-language sample). Among the other PPLAT variables, very few correlated significantly with any of the other child test or rating-scale scores, but in most cases strong relationships would not be expected.

Considerations for future use of the PPLAT. The PPLAT has undergone considerable development work to this point, but is by no means a completely developed instrument that would be immediately suitable for use in large-scale evaluations. There is, as pointed out in Appendix B, a need to modify the scoring to derive more directly interpretable variables. Cost considerations must also be taken into account; considerable time is required for testing, transcribing and coding. As modified scoring schemes are considered, however, procedures that make use of ratings applied directly to the tape recordings (rather than quantified scorings of transcriptions) may create a more feasible instrument.

It is our belief that, with the extensive development effort devoted to the PPLAT, possibilities of using it in future years of the PDC evaluation (particularly with children in kindergarten and first grade) should be carefully considered. This is particularly important given the instrument's potential as a useful measure of language proficiency or communicative competence in two languages. With the importance of the bilingual bicultural demonstration sites in the total PDC study, the PPLAT may well represent an important dimension for assessing program impact.

Adult Language Check

The Adult Language Check was developed to permit observers to focus on the language used by teachers and aides in the Head Start classrooms of the bilingual bicultural demonstration projects. Whether the adults in these classrooms use English or Spanish when interacting with children may be an important indicator of the extent to which the children are being exposed to a bilingual curriculum. Although in this respect the information may be conceptualized as part of the Implementation Study, the instrument is discussed here since classroom-level data are collected which could potentially relate to other classroom-level impact measures.

Methods. The Adult Language Check consists of a form on which the language spoken (English or Spanish) by the adult (teacher or aide) can be checked within five-minute time intervals. The observer (tester) spent about two hours in each classroom during the fall, and again during the spring testing periods. At the end of each five-minute period the observer would mark the Adult Language Check to indicate whether English, Spanish, or both languages had been spoken by the adult being observed (alternately the teacher and aide). Results were obtained simply by summing the number of intervals checked for each language across classrooms and dividing by the total number of intervals observed to obtain a percentage for each language category.

Findings. Table 18 displays the percentage of observation intervals in which observers coded the use of each language. The data show that in the Head Start classes of all three bilingual bicultural demonstration programs, both languages are indeed being used by the teaching staff. There also appear to be few differences between the PDC and comparison classes in the percentages, as might be expected, since both Head Start programs are administered within the same agency and serve basically the same population of children.

The percentages indicate some variation across sites, which appears to be consistent with what is known about the children in those sites. The Texas site, which has a higher percentage of Spanish-dominant children than the other two shows a much higher percentage of time intervals in which both languages are spoken. When children and teaching staff are truly bilingual, it seems more likely that both Spanish and English would be used within a given five-minute period.

On the basis of these data it seems that the Adult Language Check provides an efficient and inexpensive method for obtaining classroom-level information on an important feature of bilingual bicultural children's educational experience.

Table 18

Adult Language Check:

Percentage of Time Intervals in Which English, Spanish or Both Languages Were Spoken by Teachers and Aides Fall 1977 and Spring 1977

	PDC Classes			Comparison Classes		
Site	% English	% Spanish	% Both	% English	% Spanish	% Both
California						
Fall	79	16	5	57	28	15
Spring	64	36	0	49	51	0
Colorado						
Fall	77	5	18	88	6	6
Spring	79	7	14	90	6	4
Texas						
Fall	31	15	54	36	10	54
Spring	55	9	36	50	15	35

IV

EXAMINATION OF TREATMENT EFFECTS

General Treatment Effects

The issue around which this entire report is organized is that of PDC's impact to date. The question is: "Has PDC had any effect on the social competence of the children taking part in the program?" To address this question, differences between the scores of PDC and comparison group children on each measure in the basic battery were subjected to analysis of variance or covariance, as appropriate. The analyses were performed separately for children in the English-dominant and Spanish-dominant samples. For instruments that had been administered in the fall as well as in the spring, pretest score was used as a covariate and, to further reduce error variance, several blocking factors were introduced; these were: sex, ethnicity (for the English-dominant sample only), prior preschool experience, and site.[1] Analyses of the treatment effect were carried out on scores adjusted for the effects of the preceding factors. In addition, interactions among all possible pairs of design factors (all two-way interactions) were entered into the analysis. Three-, four-, and five-way interactions were not assessed in these analyses--instead, the variance attributable to these interactions was pooled into a residual error term.

Speaking more plainly, the differences between the scores obtained by PDC and comparison children were examined after the contributions of certain extraneous factors had been removed from the scores. And after the effects of all the factors had been examined individually, the effects due to particular combinations of factors were examined. This analytic procedure, by controlling for the influence on performance of factors other than the PDC program, yields a more precise assessment of program effects than would a less comprehensive analysis. And at the same time it tends to compensate for pre-existing differences between PDC and comparison children, if differences exist on the other dimensions incorporated in the analysis.

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[1] It was decided that these variables constitute the most parsimonious and yet comprehensive set that could be constructed. Exploratory analyses indicated that inclusion of mother's education (a proxy for SES) or child's age added little or no precision to the analysis.

The results of the analyses are summarized in Tables 19 and 20. The tables show:

(1) the size of the sample on which each analysis is based,

(2) the proportion of variance in the spring score that is attributable to fall score (i.e., the degree to which status in the spring is "determined" by initial status),

(3) for every factor that shows a significant ($p < .05$, two-tailed) effect on the dependent variable,

  (a) the proportion of variance it accounts for, beyond what is accounted for by factors higher in the list, and

  (b) the groups within that factor that stand highest and lowest on the dependent variable, adjusted for preceding factors.

In Table 19, for example, the first column, summarizing the analysis of BSM-English for the English-dominant sample, shows that:

- the analysis is based on the scores of 882 children,
- score on the pretest (the same test, given in fall 1976) accounts for 50% of the variance in the spring score,
- in this sample, sex is not a factor that contributes to performance on the dependent measure,
- ethnicity accounts for 4% of the remaining variance, with White children scoring highest and Asian children lowest on the adjusted measure,
- prior preschool experience accounts for 1% of the remaining variance, children with preschool scoring higher than those without, after adjustment for preceding effects,
- differences across sites account for 6% of the remaining variance, with children from PDC and comparison groups in Colorado standing highest on the adjusted measures, those from Florida standing lowest,

Table 19

Effects of PDC, Beyond Other Factors, on Spring 1977 Measures for English-Dominant Children: Analysis of Variance/Covariance Summary

	BSM-English	WPPSI	Verbal Fluency	Verbal Memory-1	Verbal Memory-3	Arm Coordination	Draw-A-Child	PIPS	POCL-1: "Task Orientation"	POCL-2: "Sociability"	CRS-1: "Friendliness"	CRS-2: "Aggressiveness"	CRS-3: "Perseverance"	CRS-4: "Independence"	CRS-5: "Self-Assurance"	CRS-6: "Resourcefulness"	Weight	Height
N	882	351	869	882	869	868	871	871	828	828	795	794	787	809	788	791	867	862
PRETEST	*50*	*39*	*24*	*26*	*22*	*18*	*29*	*14*	*19*	*19*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*81*	*52*
SEX				*½*		*2*	*1*		*½*		*3*	*2*	*3*	*1*	*1*	*1*		
Male				-			-		-		-	+	+	+	-	-		
Female				+			+		+		+	-	-	-	+	+		
ETHNICITY	*4*		*2*	*1*		*2*		*1*			*1*		*4*	*2*				
Black			+	+							-							
Hispanic																		
Indian/Alaskan								+			+		+					
White	+													-				
Asian	-		-	-				-					-	+				
PRIOR PRESCHOOL	*1*	*1*	*1*	*1*			*1*					*1*			*1*			
Yes	+	+	+	+			-					+			+			
No	-	-	-	-			+					-			-			
SITE	*6*	*2*	*7*	*9*	*3*	*2*	*2*	*3*	*7*	*7*	*3*	*5*	*4*	*3*	*3*		*1*	*2*
California-English																		
Colorado	+														-		+	
Connecticut																		
Georgia									-	-							-	
Florida	-		-	-	-	+	-	-							+			
Iowa														+				
Maryland		+	+	+									-	+				-
Michigan												+						
Texas-English					+		+		+	+								
Utah		-				-		+										
Washington																		
West Virginia												-		-				+
TREATMENT GROUP					*1*		*2*										*½*	
PDC					-		-										-	
Comparison					+		+										+	
INTERACTIONS							*7*				*12*		*14*	*12*				

Note. Numbers in italics represent percent of variance in each dependent variable accounted for by each independent variable. These figures are shown only for relationships that are significant with p < .05.

Plus and minus signs indicate the groups whose means are respectively highest and lowest on each dependent variable.

Table 20

Effects of PDC, Beyond Other Factors, on Spring 1977 Measures for Spanish-Dominant Children: Analysis of Variance/Covariance Summary

	BSM-English	BSM-Spanish	Verbal Fluency	Verbal Memory-1	Verbal Memory-3	Arm Coordination	Draw-A-Child	PIPS	POCL-1: "Task Orientation"	POCL-2: "Sociability"	Weight	Height
N	13	75	81	81	80	79	81	80	77	77	72	72
PRETEST	*80*	*35*	*27*	*48*	*15*	*6*	*16*	*3*	*15*	*15*	*72*	*44*
SEX					*3*	*4*						
Male					+	+						
Female					-	-						
PRIOR PRESCHOOL												
Yes												
No												
SITE			*7*		*12*		*9*	*9*				
California-Spanish			-		-		-	-				
Texas-Spanish			+		+		+	+				
TREATMENT GROUP								*8*				
PDC								-				
Comparison								+				
INTERACTIONS											*5*	

Note. Numbers in italics represent percent of variance in each dependent variable accounted for by each independent variable. These figures are shown only for relationships that are significant with $p < .05$.

Plus and minus signs indicate the groups whose means are respectively highest and lowest on each dependent variable.

- whether a child was in a PDC or comparison group made no difference, in itself, to the spring score, and

- when all possible combinations of two factors are examined, there is no evidence, overall, of effects associated with any particular combinations.

The purpose of summarizing the impact analyses in this way is to highlight patterns that might be difficult to discern from examination of 29 separate analyses. But to permit inspection of details, the separate analyses are reproduced in Appendix C, along with tables that display mean scores for each level of each factor before and after adjustment.

Some further statistics that portray the relative performance of PDC and comparison children are presented in Table 21. It shows each group's adjusted mean score on each measure, the sample size for each analysis, the difference between group means (with denotation of statistically significant differences), and the standard deviation of each measure. Also, for the four measures that reflected significant group differences, the difference is expressed in standard deviation units.[1]

Preliminary Analysis of Patterns

For those measures administered as pretests in the fall, pretest score is invariably the most powerful determinant of spring score. Site-specific characteristics constitute the next most powerful determinant. Whatever these site-specific characteristics may be, they presumably do not relate to children's sex, ethnicity, or prior preschool experience, since allowance is made for these factors earlier in the analytic sequence. Sex, ethnicity, and prior preschool experience all appear to contribute to fall-spring gain in a small but fairly consistent way. And after taking all these factors into account, it is apparent that membership in a PDC

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[1] It would be technically appropriate in this case to first remove from the standard deviations any variation due to group membership itself. However, while technically appropriate, this adjustment was found to be unnecessary since it did not result in alteration of the "% of SD" estimates shown in Table 21.

Table 21

Relative Status of PDC and Comparison Groups on Dependent Measures (Values Adjusted for Extraneous Factors), Spring 1977

	Adjusted Group Means						
Measure	PDC	*N*	Comp.	*N*	PDC-Comparison Difference	Standard Deviation of the Measure	Group Difference as % of SD (shown for significant differences only)
ENGLISH-DOMINANT SAMPLE							
BSM-English	10.23	470	10.43	412	-.20	3.89	
WPPSI	8.58	173	8.77	178	-.19	4.37	
Verbal Fluency	9.12	464	9.33	406	-.21	5.69	
Verbal Memory-1	14.79	470	15.26	412	-.47	6.43	
Verbal Memory-3	3.69	464	4.18	405	-.49**	2.77	.18
Arm Coordination	4.54	464	4.43	404	+.11	3.41	
Draw-A-Child	5.48	465	5.97	406	-.49***	2.61	.19
PIPS	2.62	465	2.83	406	-.21	1.76	
POCL-1: *Task Orientation*	34.47	436	34.09	392	+.38	9.66	
POCL-2: *Sociability*	13.54	436	13.10	392	+.44	3.79	
CRS-1: *Friendliness*	18.79	431	18.49	364	+.30	3.62	
CRS-2: *Aggressiveness*	23.21	437	23.34	357	-.13	5.36	
CRS-3: *Perseverance*	29.28	442	29.23	351	+.05	5.99	
CRS-4: *Independence*	5.81	441	5.64	368	+.17	1.61	
CRS-5: *Self-Assurance*	30.63	435	30.89	353	-.26	6.04	
CRS-6: *Resourcefulness*	12.33	437	12.62	354	-.29	2.54	
Weight	40.49	466	40.86	401	-.37	6.05	.06
Height	42.62	464	42.62	398	0	2.20	
SPANISH-DOMINANT SAMPLE							
BSM-English	7.82	7	4.05	6	+3.77	5.22	
BSM-Spanish	12.56	32	12.44	43	+.12	2.77	
Verbal Fluency	8.41	37	7.78	44	+.63	4.81	
Verbal Memory-1	17.34	37	16.90	44	+.44	6.19	
Verbal Memory-3	5.02	36	4.53	44	+.49	2.65	
Arm Coordination	6.88	36	5.87	43	+1.01	3.86	
Draw-A-Child	6.42	37	6.40	44	+.02	1.97	
PIPS	2.68	37	3.69	44	-1.01*	1.90	.53
POCL-1: *Task Orientation*	39.37	35	35.56	42	+3.81	9.83	
POCL-2: *Sociability*	13.61	35	13.13	42	+.48	4.07	
Weight	41.02	33	40.24	39	+.78	5.17	
Height	41.95	33	42.10	39	-.15	2.11	

$*p < .05$; $**p < .01$; $***p < .001$.

or comparison group is a matter of minor consequence. Across the 30 analyses performed for the English-dominant and Spanish-dominant samples, four are statistically significant (all in favor of the comparison group, if weight gain is considered a favorable result). But for all these four, the proportion of variance accounted for by group membership is negligible. For the largest difference (.53 standard deviations on PIPS in the Spanish-dominant sample), group membership accounts for only 8% of the variance in the outcome measures (see Table 20); for the other differences group membership accounts for 2% of the variance or less (see Table 19). As Table 21 shows, the differences are very small in terms of standard deviation units.

Assessment of the Magnitude of PDC-Comparison Differences

Within the sample of English-dominant children, the largest difference between PDC and comparison groups--on Draw-A-Child--amounts to only .19 standard deviations. To illustrate the small magnitude of this difference, Figure 1 shows the profiles of two populations whose means are separated by that same distance on a normally distributed variable.

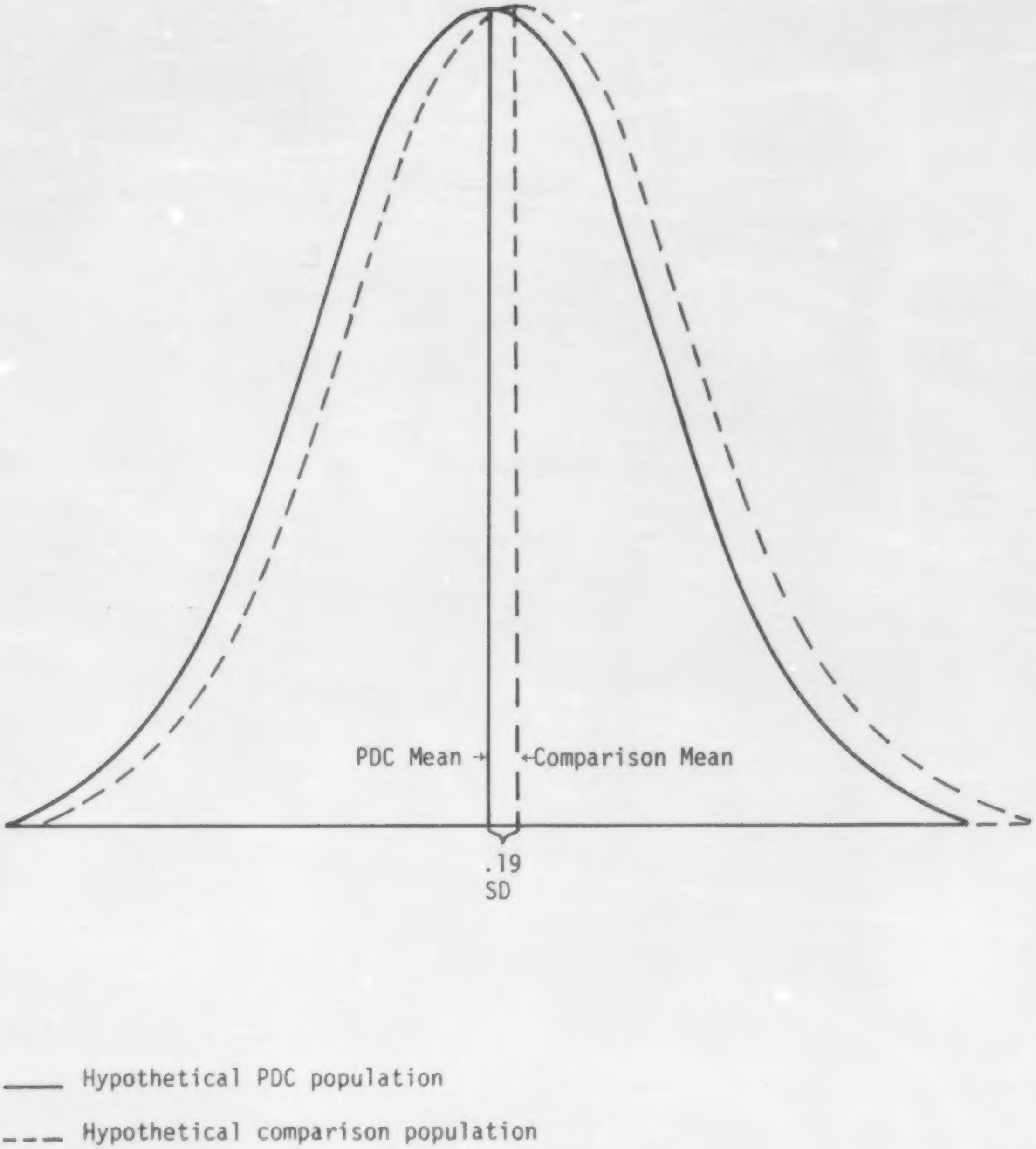
If the difference found between PDC and comparison children on Draw-A-Child represents a true difference between the populations that the present samples stand for, and if Draw-A-Child score is distributed normally within both those populations, then Figure 1 shows what that difference would look like. The solid line represents the PDC population and the broken line the comparison population. The distance between the means of the two populations is .19 standard deviations, and about 7% of the children in either distribution fall within this space. In other words, about 57% of the comparison population is above the mean of the PDC population.

Considering the fact that this represents the largest difference found between the English-dominant PDC and comparison samples, and that the samples are virtually identical on 15 out of the 18 variables examined, it seems reasonable to say that the two groups made identical progress from fall to spring--that there was essentially no difference either way between these PDC and comparison children.

The differences between the Spanish-dominant PDC and comparison groups are more difficult to assess, though, since they are larger in magnitude yet only one reaches statistical significance (and that one in a direction opposite most of the other differences). This situation may be due in part to some basic inequality (noted in Interim Report VI, March 1977)

Figure 1

Illustration of Two Normally Distributed Populations Whose Means are .19 Standard Deviations Apart



between the two groups of Spanish-dominant children. At present, there is simply not enough information to allow identification of a pattern of effects within the Spanish-dominant sample. As the evaluation progresses through the years, however, and data accumulate, the pattern will probably become more distinct.

Examination of Treatment Effects Under Specified Conditions

On the basis of the analysis of general treatment effects and the magnitude of the differences between groups, it appears that there is little difference in general in the gains made by the PDC and comparison children during the Head Start year. But even with this finding, it is conceivable that PDC could have produced beneficial effects under certain conditions; for example, one could argue that since the character of the PDC program varies from site to site, positive effects might be found if we looked only at sites with certain special qualities. In technical terms, this argument hypothesizes an interaction between program (PDC vs. comparison) and site; i.e., it proposes that the program has produced effects in some places but not in others. The analyses examining this proposition are described in this section.

The analyses of PDC's effects described above incorporated four factors besides the treatment factor itself. These were: sex, ethnicity, prior preschool experience, and site. One purpose of including these other factors, all of which presumably contribute to test performance differences among children, was to provide greater sensitivity to possible treatment effects. (Inclusion of these factors plus a covariate--fall test score--reduced extraneous variation that might have clouded the object of actual interest.) A second purpose of including these other factors was to detect the presence of interactions between them and the treatment factor.

Since there are theoretically hundreds of ways in which the treatment effect could interact with the effects of the other four factors, and since these possibilities are multiplied by the number of dependent variables considered, the scope of investigation was restricted by the following rules:

1. Only statistically significant ($p < .05$) two-way interactions involving the treatment factor were examined (three-, four-, and five-way interactions were excluded);

2. These two-way interactions were examined only for analyses in which the aggregated effect of all two-way interactions was statistically significant;

3. Scores on subscales of the Child Rating Scale were excluded from the set of dependent variables because this instrument was completed by PDC teachers for PDC group children and by comparison teachers for comparison group children, and is thus inherently susceptible to interactive effects involving the treatment group factor.

As it turned out, there were no interactions remaining to be investigated after application of these rules. In other words, there was no compelling evidence to indicate that there are special conditions under which PDC produces an extra effect over the regular Head Start program. It cannot be said, for example, that PDC produced benefits for Head Start girls but not for Head Start boys, or that it worked better for one ethnic group than for another.

Thus, after examining the possibility of exceptions, the general conclusion remains unchanged: there are virtually no differences in the progress of PDC and comparison children from fall to spring of the Head Start year.

Interpretation of the First-Year Effects of PDC

Given the finding of virtually no group differences, it can be said that the first year of PDC had no measurable effect on the children in the sample--no effect, that is, beyond the basic effect of Head Start (which we cannot estimate, since both groups experienced Head Start).[1]

Interpretations of this result may vary depending on one's initial expectations, and a survey of the PDC evaluation's audience would probably reveal three different expectations:

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[1] It might be pointed out that the sensitivity-to-change analyses described earlier have some bearing on the question of general Head Start effects. Although they are not the strongest evidence one might seek, the analyses are consistent with the expectation that Head Start children will show greater gains during the year then would be expected on the basis of maturation alone.

1. PDC should have an effect on the performance of Head Start children because the program is intended to be of immediate benefit.

2. PDC should not have a first-year effect on the progress of the children in the sample because the essence of the program is continuity and no grade-to-grade continuity is experienced until children advance from Head Start to the elementary school;

3. PDC should have a first-year effect on children, but the effect will not appear until later years when the advantage provided by the Head Start experience impacts on the children's elementary school performance.

The difference between the second and third expectations is subtle but real. Saying that there is an invisible effect (or "sleeper" effect) of the first year means that even if the children went on to a non-PDC elementary school, the benefits of their PDC Head Start year might eventually show up. On the other hand, saying that there ought to be no effect in the absence of grade-to-grade continuity means that a child who went from a PDC Head Start to a non-PDC elementary school would never realize the benefit of the first PDC year.

While it is for each reader to decide which expectation is the most plausible, there is much to commend the view that the program's effects should not be immediate but should be realized gradually, as each year of the PDC experience builds on preceding years. Thus it seems quite reasonable to have found no substantial difference between the PDC and comparison groups at this year point in the program.

Relationship Between Educational Environment Factors and Children's Test Performance

One of PDC's main purposes is to bring about the kinds of changes in the environment of the Head Start/elementary school community that will eventually benefit the community's children. Within the context of the PDC evaluation, benefit to children has been defined mainly in terms of the measures included in the PDC battery; changes in the education environment have been defined mainly in terms of the dimensions incorporated in the Implementation Rating Instrument (IRI), the Cost Study, and the PDC Classroom Observation System. Whether these changes really do affect children's development, and if so by how much, is open to question. Some responses to this question are provided by the exploratory analyses described here.

Identification of Educational Environment Factors

An effort was made to be as comprehensive as possible in this initial investigation so that future investigations could concentrate on the prominent issues emerging from this phase. Information about the educational environment in PDC sites came from three major sources, described below, and all of the educational environment factors are listed and defined in Table 22.

PDC Implementation Rating Instrument (IRI).[1] This instrument provided ratings of the degree to which the PDC *Guidelines* have been implemented in each of the nine sites visited in winter 1977. The scales selected from the IRI for these analyses represent (a) mean objective ratings for each of the seven major PDC components, (b) mean judgmental ratings for each of the seven components, (c) mean objective ratings for the individual subcomponents of Education, (d) judgmental ratings for the same subcomponents, and (e) mean objective ratings on items aggregated into four supplementary scales, each of which concerns particular PDC activities at the Head Start level. These five classes of scales represent the major dimensions of the IRI.

PDC Classroom Observation System. This instrument provides classroom-level measures that characterize children's classroom behavior on several dimensions; five of the key variables were included in these analyses.

PDC Cost Study. This study provided cost data that describe (a) the allocation of the PDC grant across the seven program components and (b) the value of all resources utilized across the seven components: the resource utilization figures include such resources as public school support and donated services in addition to the PDC grant.

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[1] For a more detailed description of this instrument, see *Interim Report IV, Volume 2: Development of the Implementation and Cost Studies* (August 1976).

Table 22
List of School Environment Factors Examined

FROM THE CLASSROOM OBSERVATION SYSTEM

1. *Percent of noninvolved activities*: proportion of all instances observed during which child was not interacting with a person or an object nor engaged in a purposeful activity.

2. *Percent of social activities*: proportion of all instances observed during which child was interacting with another child or an adult.

3. *Percent of nonsocial activities*: proportion of all instances observed during which child was engaged in a purposeful activity that did not involve others.

4. *Percent nonverbal*: proportion of instances judged "social" during which child did not speak.

5. *Percent peer interaction*: proportion of social interactions involving children (rather than adults).

FROM THE IMPLEMENTATION RATING INSTRUMENT

6. *Implementation of Education subcomponent 1 (objective rating)*: mean rating on items related to ongoing discussion of curriculum.

7. *Implementation of Education subcomponent 2 (objective rating)*: mean rating on items related to Head Start-elementary coordination.

8. *Implementation of Education subcomponent 3 (objective rating)*: mean rating on items related to installation of a PDC curriculum.

9. *Implementation of Education subcomponent 4 (objective rating)*: mean rating on items related to individualization of instruction.

10. *Implementation of Education subcomponent 1 (judgmental rating)*: judgment of this subcomponent's overall implementation.

11. *Implementation of Education subcomponent 2 (judgmental rating)*: judgment of this subcomponent's overall implementation.

12. *Implementation of Education subcomponent 3 (judgmental rating)*: judgment of this subcomponent's overall implementation.

13. *Implementation of Education subcomponent 4 (judgmental rating)*: judgment of this subcomponent's overall implementation.

14. *Implementation of the Administration component (objective rating)*: mean rating on all items related to Administration guidelines.

15. *Implementation of the Education component (objective rating)*: mean rating on all items related to Education guidelines.

16. *Implementation of the Training component (objective rating)*: mean rating on all items related to Administration guidelines.

17. *Implementation of the Parent Involvement component (objective rating)*: mean rating on all items related to Parent Involvement guidelines.

18. *Implementation of the Developmental Support Services component (objective rating)*: mean rating on all items related to the Developmental Support Services guidelines

19. *Implementation of the Handicapped Services component (objective rating)*: mean rating on all items related to Handiapped Services guidelines.

20. *Implementation of the Bilingual Multicultural component (objective rating)*: mean rating on all items related to Bilingual Multicultural guidelines.

21. *Implementation of the Administration component (judgmental rating)*: judgment of this component's overall implementation.

22. *Implementation of the Education component (judgmental rating)*: judgment of this component's overall implementation.

23. *Implementation of the Training component (judgmental rating)*: judgment of this component's overall implementation.

Table 22
List of School Environment Factors Examined
(Continued)

24. *Implementation of the Parent Involvement component (judgmental rating)*: judgment of this component's overall implementation.

25. *Implementation of the Developmental Support Services component (judgmental rating)*: judgment of this component's overall implementation.

26. *Implementation of the Handicapped Services component (judgmental rating)*: judgment of this component's overall implementation.

27. *Implementation of the Bilingual Multicultural component (judgmental rating)*: judgment of this component's overall implementation.

28. *Supplementary scale 1--parent involvement*: mean rating on all items related to parent involvement in the PDC program at the Head Start level.

29. *Supplementary scale 2--teacher involvement*: mean rating on all items related to teacher involvement in the PDC program at the Head Start level.

30. *Supplementary scale 3--communication/coordination*: mean rating on all items related to communication and coordination between PDC Head Start and PDC elementary schools.

31. *Supplementary scale 4--classroom activities*: mean rating on all items related to classroom activities at the Head Start level.

FROM THE COST STUDY

32. *Total value of resources utilized in the Developmental Support Services component*: monetary value of resources utilized on this component from all sources.

33. *Total value of resources utilized in the Education component*: monetary value of resources utilized on this component from all sources.

34. *Total value of resources utilized in the Parent Involvement component*: monetary value of resources utilized on this component from all sources.

35. *Total value of resources utilized in the Handicapped Services component*: monetary value of resources utilized on this component from all sources.

36. *Total value of resources utilized in the Bilingual Multicultural component*: monetary value of resources utilized on this component from all sources.

37. *Total value of resources utilized in the Administration component*: monetary value of resources utilized on this component from all sources.

38. *Total value of resources utilized in the Training component*: monetary value of resources utilized on this component from all sources.

39. *PDC grant expenditures on the Developmental Support Services component*: actual expenditures on this component from the PDC grant.

40. *PDC grant expenditures on the Education component*: actual expenditures on this component from the PDC grant.

41. *PDC grant expenditures on the Parent Involvement component*: actual expenditures on this component from the PDC grant.

42. *PDC grant expenditures on the Handicapped Services component*: actual expenditures on this component from the PDC grant.

43. *PDC grant expenditures on the Bilingual Multicultural component*: actual value of expenditures on this component from the PDC grant.

44. *PDC grant expenditures on the Administration component*: actual expenditures on this component from the PDC grant.

45. *PDC grant expenditures on the Training component*: actual expenditures on this component from the PDC grant.

OTHER

46. *Program model--ECS vs. PSL*: administrative relationship between Head Start and elementary school; in the Early Childhood School model these entities are integrated, in the Preschool-School Linkage model they are separate.

Beyond these categories, there was one final educational environment factor taken into account--the distinction between two administrative models for PDC: Early Childhood School (ECS) and Preschool-School Linkages (PSL).

Selection of Measures from the PDC Battery

The following measures (which are described in Appendix A) were selected as the indices against which the effects of the environmental factors would be assessed (i.e., these were the dependent variables in the analyses):

- Bilingual Syntax Measure-English (BSM-E)
- Verbal Fluency
- Verbal Memory-1
- Verbal Memory-3
- Arm Coordination
- Draw-A-Child
- Preschool Interpersonal Problem-Solving Test (PIPS)
- Pupil Observation Checklist-1 (POCL-1: Task Orientation)
- Pupil Observation Checklist-2 (POCL-2: Sociability)

Not included in these analyses were scores on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and the PDC Child Rating Scale. These instruments had not been administered to all the children in all sites, and thus were not suitable for inclusion in multivariate analyses, which require complete data on all variables.

Since the basic aim of the analyses was to identify environmental factors related to children's development during the Head Start year, spring 1977 scores on these measures were adjusted by partialling out the contribution of each child's score on the same measures in fall 1976. The residual was that part of the child's spring score that could not be accounted for as a function of his or her initial status. All the raw scores were converted into $\underline{z}$ scores before the adjustments were made so that the residual for each measure could be expressed in the same metric--as a proportion of the original standard deviation.

Composition of the Sample

The analyses were carried out on the scores of the non-handicapped English-dominant children from PDC and comparison groups for whom complete data were available on all of the tests involved. The maximum size of this sample was 796. (Up to this maximum, the size of the analytic sample varied across analyses, depending on the availability of information about the educational environment factor under examination.)

Analytic Rationale

The educational environment factors were all defined at the site level, thus the values of these factors were the same for every child within a given site. The same values were assigned to children in a site's PDC and comparison groups, even though the data had been collected only in relation to the PDC group. (An exception: Observation System data had been obtained for every child in the PDC and comparison testing samples. The data were averaged for each separate Head Start classroom, then the classroom averages were averaged and the results assigned to all PDC and comparison children within a site.)

The analyses that were performed sought to determine the relationship between children's test scores and each educational environment factor.[1] As has just been noted, most of these factors are based on data obtained with reference to PDC groups only, and yet the analytic strategy followed was to ascribe the same characteristics to the environments of the comparison group children, site by site. The following four points trace the reasoning that led to this analytic strategy, and Figure 2 recapitulates the reasoning.

- The environment surrounding PDC children in a given site is not necessarily the product of PDC--it may be the local educational environment that pre-existed PDC. If so, it is plausible to assume that the environment surrounding comparison group children in the same site is very similar, since the comparison elementary and Head Start centers are nearby, and were selected expressly because of their comparability with PDC centers and schools. To equate the environments of PDC and comparison children within sites for analytic purposes is essentially to hypothesize that the environments are the same.

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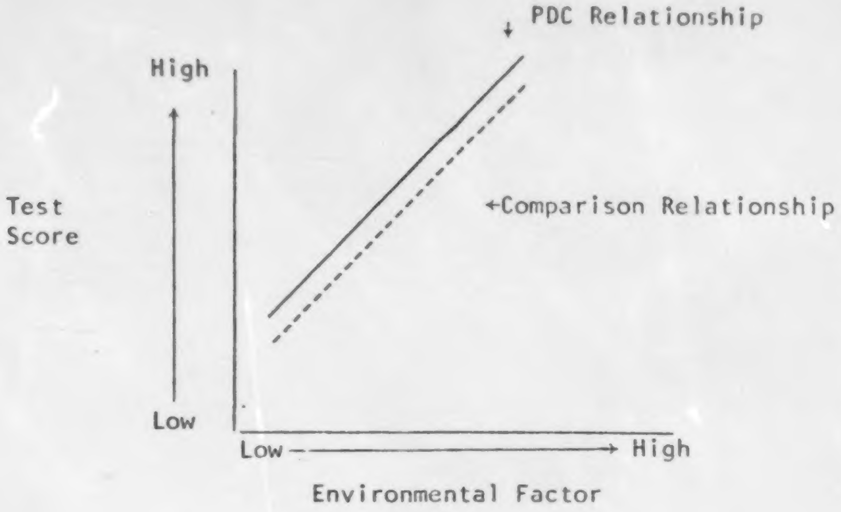
[1] It must be kept in mind that these analyses are mainly concerned with the effects of the educational environment at the Head Start level, and with the origins of that environment. The lack of elementary school test data and comparison school implementation ratings prohibit any conclusions about the effects and origins of the elementary-level environment.

Figure 2
Illustration of the Analytic Rationale Under Two Conditions

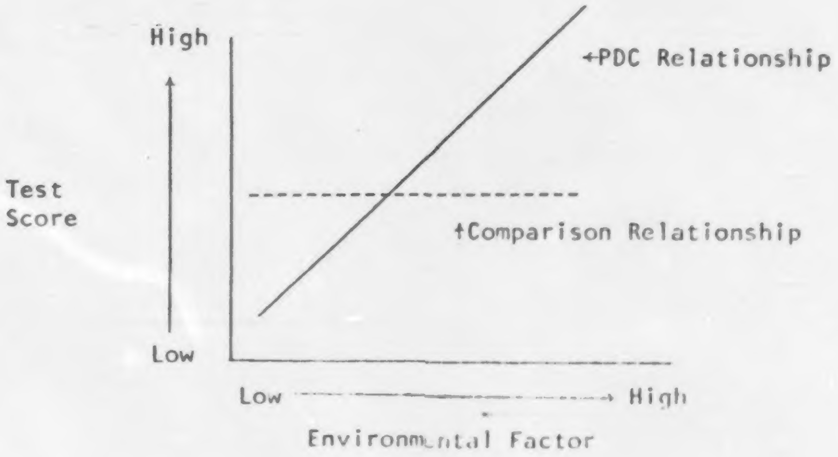
Figure 2a. Same Relationship Within PDC and Comparison Groups Between Environmental Factor and Children's Performance


PDC Relationship
High
Test Score
Low
Comparison Relationship
Low
High
Environmental Factor

Same relationship implies same environments.

Conclusion: same environments to begin with--no PDC influence.

Figure 2b. Different Relationships Within PDC and Comparison Groups Between Environmental Factor and Children's Performance


High
PDC Relationship
Test Score
Comparison Relationship
Low
Low
High
Environmental Factor

Different relationship implies different environments.

Conclusion: some PDC influence or environments different to begin with.

- If the environments are indeed the same then analysis should show that relationships between environmental factors and test scores are the same for both groups. Thus if statistical estimates of these relationships are essentially the same for PDC and comparison children, this constitutes support for the hypothesis of equivalent environments. In this event, conclusions about the effects of the environmental factors can be based upon data from the combined groups and the environments common to the groups can be considered to be independent of PDC's influence. Thus high IRI ratings, for example, might be considered to reflect some characteristic native to a local community rather than reflecting the specific influence of PDC.

- On the other hand, if the analyses indicate that the relationships between environment and test performance are *not* the same for PDC and comparison Head Start children, the different relationships are probably due to dissimilarity of their environments. In this event, conclusions about the effects of the environmental factors can only be based on data from the PDC groups, because the factors were assessed only for these groups.

- As noted in the second point above, the finding of similar environment-performance relationships for the PDC and comparison groups would imply that the PDC program had not measurably influenced the environment of the PDC Head Start centers; but if different relationships were found to hold for the two groups, the proper conclusion would be that *either* PDC had influenced the PDC group's environment *or* the environment had been different to begin with.

Analytic Method

Each environment factor whose effect was to be examined was first transformed into a categorical variable with two levels. The dividing line used for these transformations was the median value of the untransformed variable: thus each of the two new categories contained about half of all the cases.

Multivariate analyses of variance[1] were then performed to examine the function of the dichotomous educational environment factor in the model shown below:

predicted test scores = grand mean
+ effect of environment factor
+ effect of treatment group factor
+ effect of environment-by-group interaction.

The indices of effect in this model were children's adjusted spring test scores, analyzed jointly. The element of central interest in this model was the effect of the environment factor, representing the relationship between environment and performance. To the extent that this relationship differed from the PDC to the comparison group it would be reflected in the effect of the environment-by-group interaction term.

Results

Table 23 expresses the results of the analyses in terms of the canonical correlations and probability values associated with each element in the model. (Each canonical correlation is a measure of the relationship between the environment factor and the collective dependent variables. It can be thought of as a multiple correlation.) Of the 46 school environment factors analyzed, all but 15 were found to bear a significant relationship to test performance. A small but significant effect was found for the treatment group factor, corroborating findings presented above in the section on general treatment effects. And seven significant interactions (out of 46 possibilities) appeared between the environment and group factors.

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[1] One reason for performing multivariate rather than univariate analyses of variance (MANOVA rather than ANOVA) was that the number of environment factors whose effects were to be examined was so large (46) that it would have been impractical to perform and document separate analyses for each individual test score. Another advantage of MANOVA is that it allows application of a single, uncompounded significance criterion when evaluating effects across multiple dependent variables.

Table 23

Canonical Correlations Associated with the Educational Environment and Treatment Group Factors and Their Interactions

(Dependent Variables: Children's Adjusted Scores on Nine Measures from the Spring PDC Battery)

	N	Educational Environment Factor (see first column)	Treatment Group (PDC vs. Comparison)[a]	Environment-by-Group Interaction
Observation System Factors				
1. % Noninvolved	796	.31**	.16*	.17**
2. % Social	796	.19**		.10
3. % Nonsocial	796	.26**		.15
4. % Nonverbal	796	.23**		.12
5. % Peer Interaction	796	.27**		.18**
IRI Factors				
6. Education-1 (O)	598	.24**	(see footnote a)	.11
7. Education-2 (O)	598	.29**		.20**
8. Education-3 (O)	598	.31**		.15
9. Education-4 (O)	598	.20**		.14
10. Education-1 (J)	501	.27**		.18*
11. Education-2 (J)	598	.48**		.18
12. Education-3 (J)	598	.21**		.17
13. Education-4 (J)	598	.21**		.17
14. Administration-Total (O)	598	.19*		.09
15. Education-Total (O)	598	.25**		.13
16. Training-Total (O)	598	.11		.07
17. Parent Involvement-Total (O)	598	.15		.13
18. Developmental Support Services-Total (O)	598	.17*		.11
19. Handicapped-Total (O)	598	.12		.13
20. Bilingual Multicultural-Total (O)	528	.17		.13
21. Administration-Total (J)	598	.16		.10
22. Education-Total (J)	598	.31**		.17*
23. Training-Total (J)	598	.10		.09
24. Parent Involvement-Total (J)	598	.17		.14
25. Developmental Support Services-Total (J)	598	.17*		.11
26. Handicapped-Total	598	.10		.09
27. Bilingual Multicultural-Total (J)	528	.34**		.16
28. Supplementary-1	598	.19*		.12
29. Supplementary-2	598	.10		.09
30. Supplementary-3	598	.15		.09
31. Supplementary-4	598	.11		.07

(Continued)

Table 23
(Continued)

	N	Educational Environment Factor (see first column)	Treatment Group (PDC vs. Comparison)[a]	Environment-by-Group Interaction
Cost Study Factors				
32. Developmental Support Services-Total Resources	796	.24**	(see footnote a)	.16*
33. Education-Total Resources	796	.18**		.16*
34. Parent Involvement-Total Resources	796	.35**		.16*
35. Handicap Services-Total Resources	796	.29**		.13
36. Bilingual Multicultural-Total Resources	796	.17**		.11
37. Administration-Total Resources	796	.22**		.12
38. Training-Total Resources	796	.22**		.10
39. Developmental Support Services-PDC $	796	.20**		.11
40. Education-PDC $	796	.14		.14
41. Parent Involvement-PDC $	796	.19**		.12
42. Handicap Services-PDC $	796	.13		.12
43. Bilingual Multicultural-PDC $	796	.09		.14
44. Administration-PDC $	796	.19*		.11
45. Training-PDC $	796	.14		.10
Other Factors				
46. Program Model	796	.23*		.13

*p < .05 (two-tailed).
**p < .01 (two-tailed).

[a] The canonical correlation associated with this term is reported only for the first analysis, since subsequent analyses all gave virtually the same result (a coefficient of .14 to .18, significant with p < .05).

Although most of the effects associated with the environment factors are statistically significant, they are generally small. Figures 3a-3r illustrate the magnitude of the factors found to be prominent. The criterion of "prominence" was a canonical correlation of .22 or higher. This value was chosen because a correlation of less than .22 accounts for less than 5% of the variance in the dependent variables. A factor with such low explanatory power was considered negligible, even if its effect was statistically significant.

In Figure 3, the mean status of the group in the low (at-or-below-median) category of each environment factor is shown as a baseline with value 0. The mean status of the high (above-median) group is shown in reference to that baseline. Thus in Figure 3a, for example, the group in the high category on the "% involved" factor from the classroom observations scored about .25 standard deviations higher than the other group on BSM-English (the first-listed measure) but about .25 standard deviations lower on POCL-2 (the last-listed measure).

Interestingly, all of the educational environment factors whose effects are illustrated lend themselves to placement in one or the other of two classes. The first consists of those that have a markedly more positive effect on six of the measures (ones which share a cognitive component) than on the other three.[1] The second class of factors consists of those that tend to have the opposite effect--markedly more negative for the six cognitive measures than for the remaining three. Table 24 lists these two classes of factors along with their mean effects for the two sets of measures.

Note in Table 24 that of the 12 factors that show a positive relationship with children's performance on the cognitive measures, seven represent assessments of the education component. Of the six factors in the class that show a negative relationship with children's cognitive performance, four concern total resource utilization on PDC components. Since it seems illogical to conclude that as use of educational resources rises test scores fall, the most reasonable conclusion is probably that, in areas where test scores are lower, use of compensatory resources is higher.

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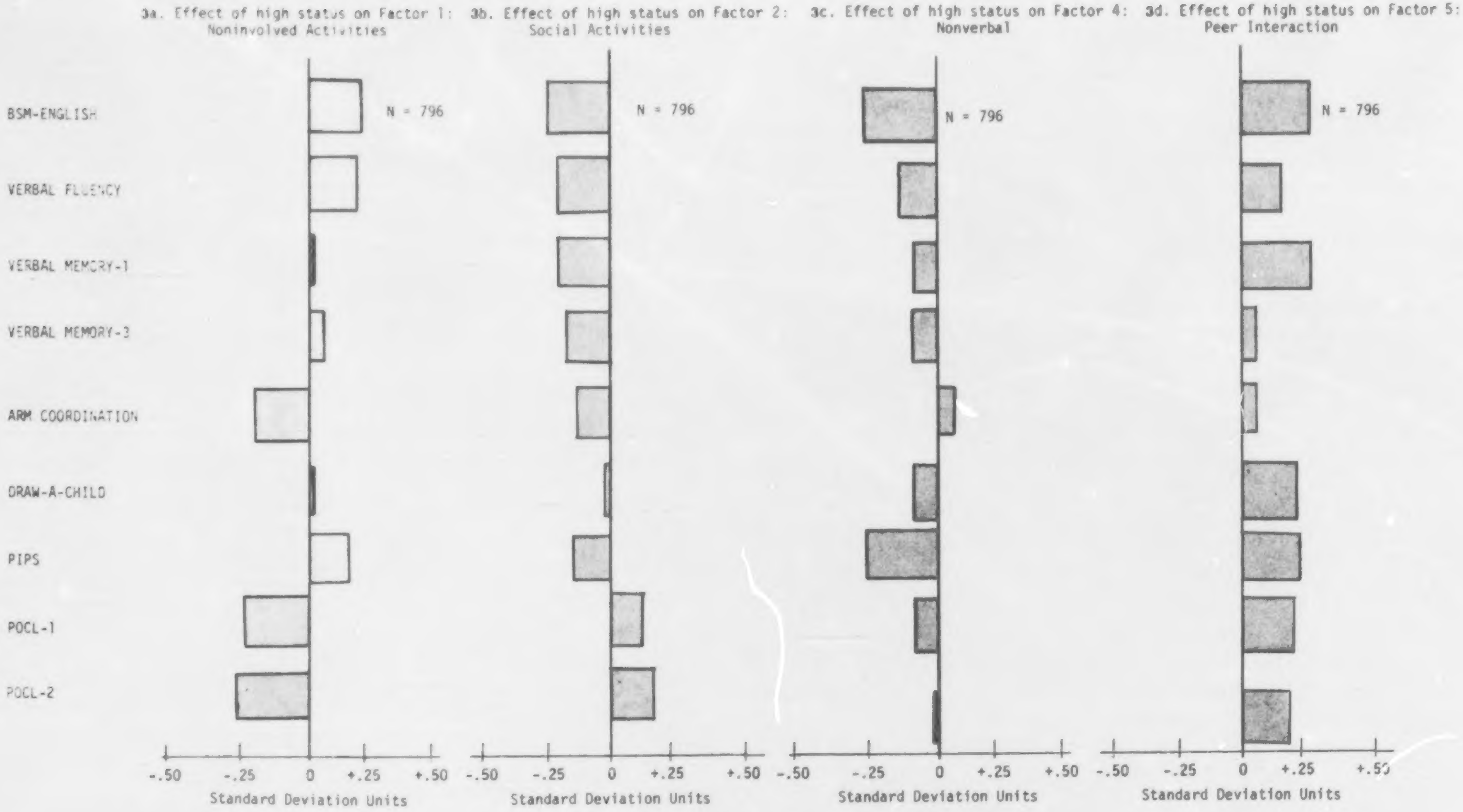
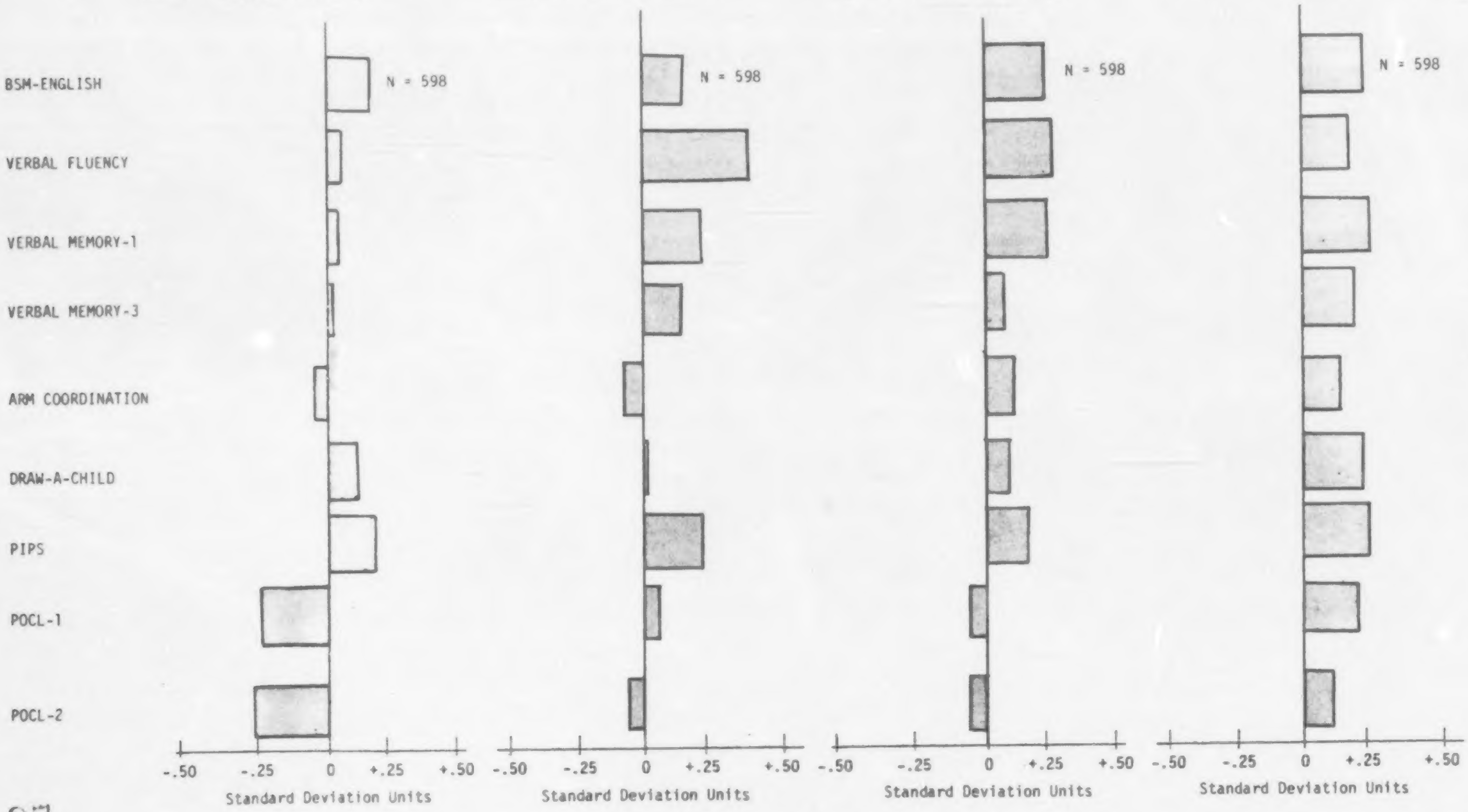
[1] The six cognitive measures are BSM-English, Verbal Fluency, Verbal Memory-1, Verbal Memory-3, Draw-A-Child, and PIPS.

Figure 3
Effects of "Prominent" Educational Environment Factors on Adjusted Spring Test Scores of PDC and Comparison Children (English-Dominant Analytic Sample)



Note. The effects graphed represent differences between the mean standardized fall-to-spring "gain" scores of two groups: (1) the PDC and comparison children from sites high on the factor identified and (2) the PDC and comparison children from sites low on the same factor.

Figure 3
Effects of "Prominent" Educational Environment Factors on Adjusted
Spring Test Scores of PDC and Comparison Children (English-Dominant Analytic Sample)



3e. Effect of high status on Factor 6: Implementation of Education Subcomponent 1 (Objective Rating)

3f. Effect of high status on Factor 7: Implementation of Education Subcomponent 2 (Objective Rating)

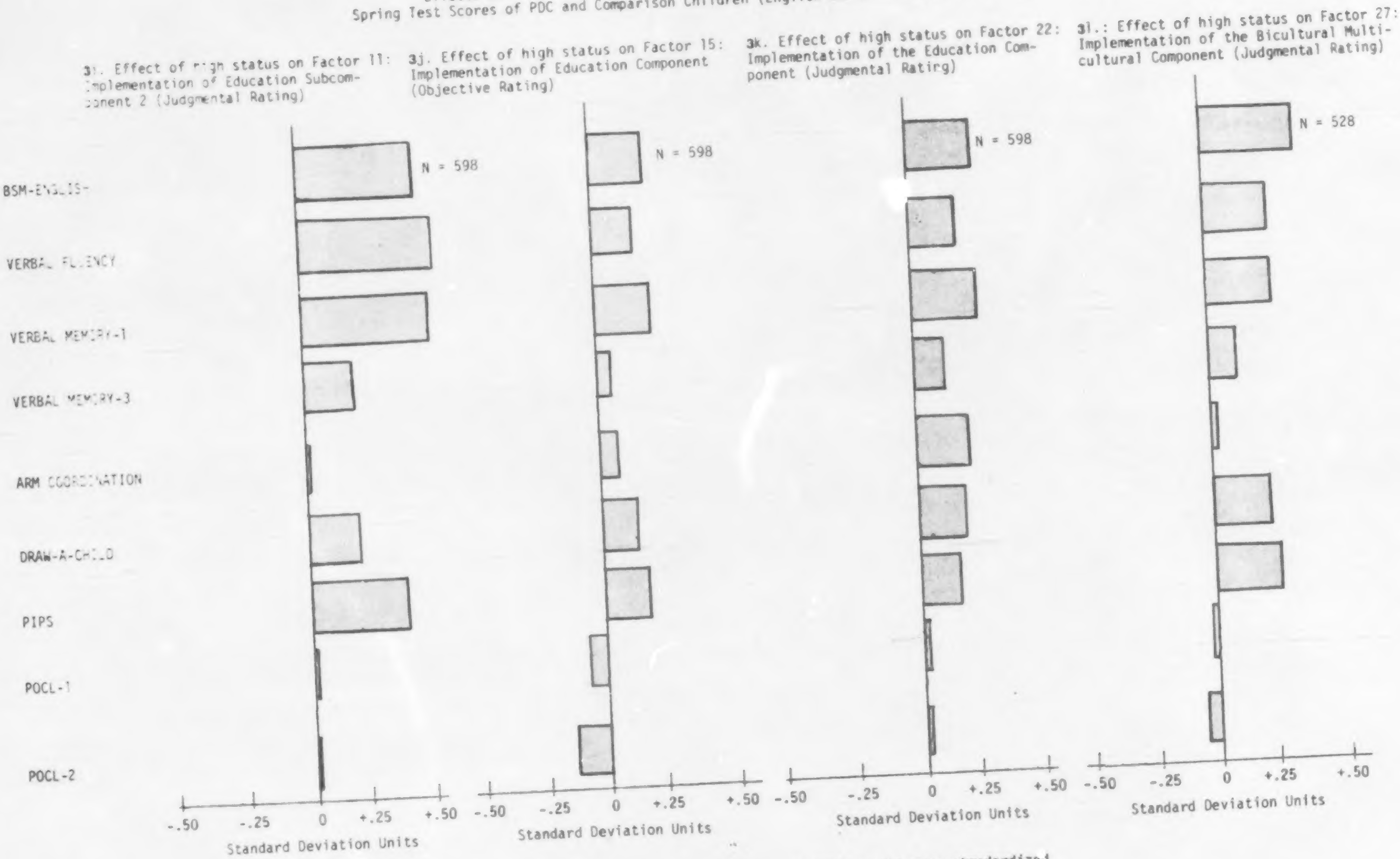
3g. Effect of high status on Factor 8: Implementation of Education Subcomponent 3 (Objective Rating)

3h. Effect of high status on Factor 10: Implementation of Education Subcomponent 1 (Judgmental Rating)

BSM-ENGLISH
VERBAL FLUENCY
VERBAL MEMORY-1
VERBAL MEMORY-3
ARM COORDINATION
DRAW-A-CHILD
PIPS
POCL-1
POCL-2
N = 598
N = 598
N = 598
N = 598
-.50
-.25
0
+.25
+.50
Standard Deviation Units
-.50
-.25
0
+.25
+.50
Standard Deviation Units
-.50
-.25
0
+.25
+.50
Standard Deviation Units
-.50
-.25
0
+.25
+.50
Standard Deviation Units

Note. The effects graphed represent differences between the mean standardized fall-to-spring "gain" scores of two groups: (1) the PDC and comparison children from sites high on the factor identified and (2) the PDC and comparison children from sites low on the same factor.

Figure 3
Effects of "Prominent" Educational Environment Factors on Adjusted Spring Test Scores of PDC and Comparison Children (English-Dominant Analytic Sample)


3i. Effect of high status on Factor 11: Implementation of Education Subcomponent 2 (Judgmental Rating)

3j. Effect of high status on Factor 15: Implementation of Education Component (Objective Rating)

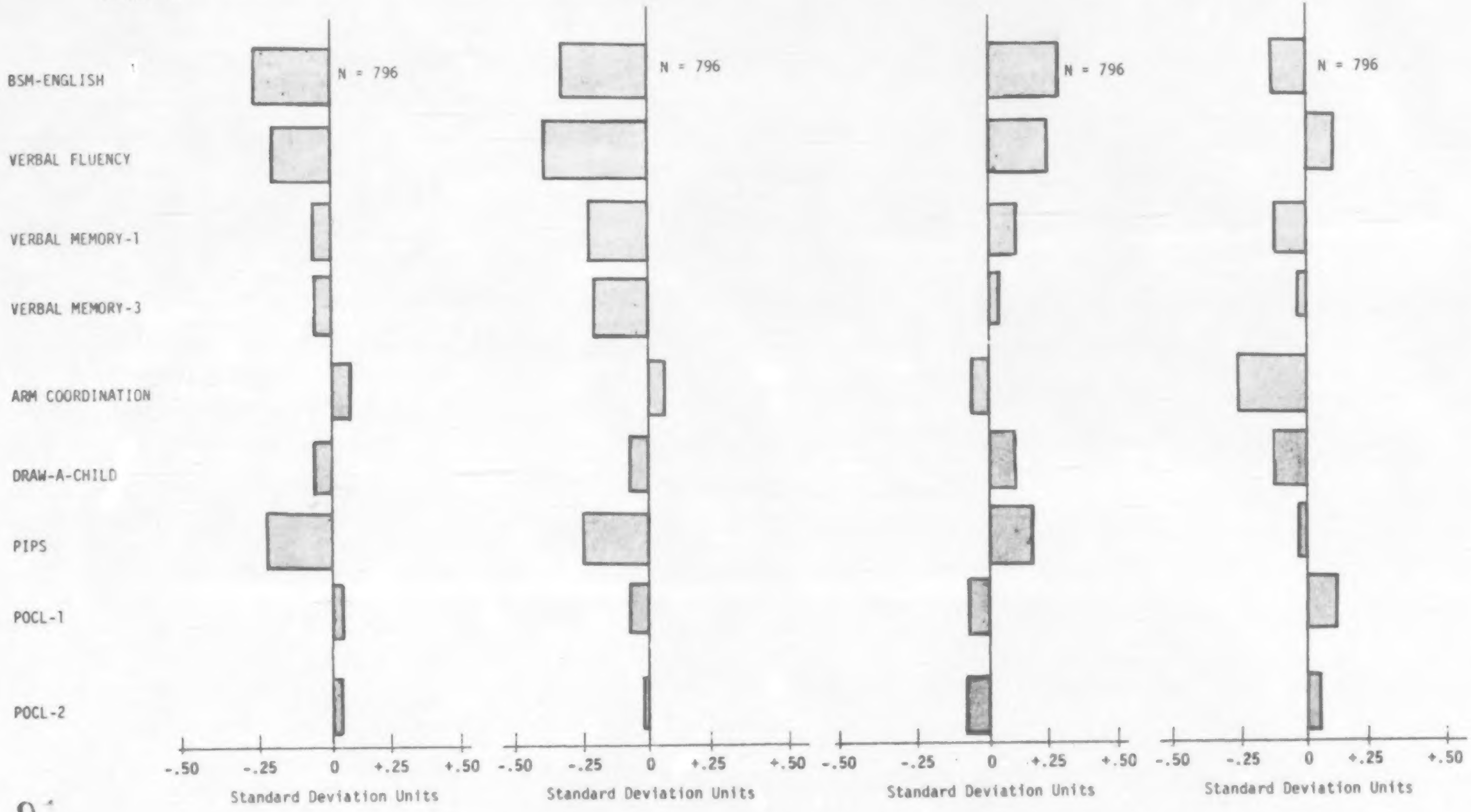
3k. Effect of high status on Factor 22: Implementation of the Education Component (Judgmental Rating)

3l.: Effect of high status on Factor 27: Implementation of the Bicultural Multicultural Component (Judgmental Rating)

BSM-ENGLISH
VERBAL FLUENCY
VERBAL MEMORY-1
VERBAL MEMORY-3
ARM COORDINATION
DRAW-A-CHILD
PIPS
POCL-1
POCL-2
N = 598
N = 598
N = 598
N = 528
-.50
-.25
0
+.25
+.50
Standard Deviation Units

Note. The effects graphed represent differences between the mean standardized fall-to-spring "gain" scores of two groups: (1) the PDC and comparison children from sites high on the factor identified and (2) the PDC and comparison children from sites low on the same factor.

Figure 3
Effects of "Prominent" Educational Environment Factors on Adjusted Spring Test Scores of PDC and Comparison Children (English-Dominant Analytic Sample)



3m. Effect of high status on Factor 32: Total value of resources utilized in the Developmental Support Services Component

3n. Effect of high status on Factor 34: Total value of resources utilized in the Parent Involvement Component

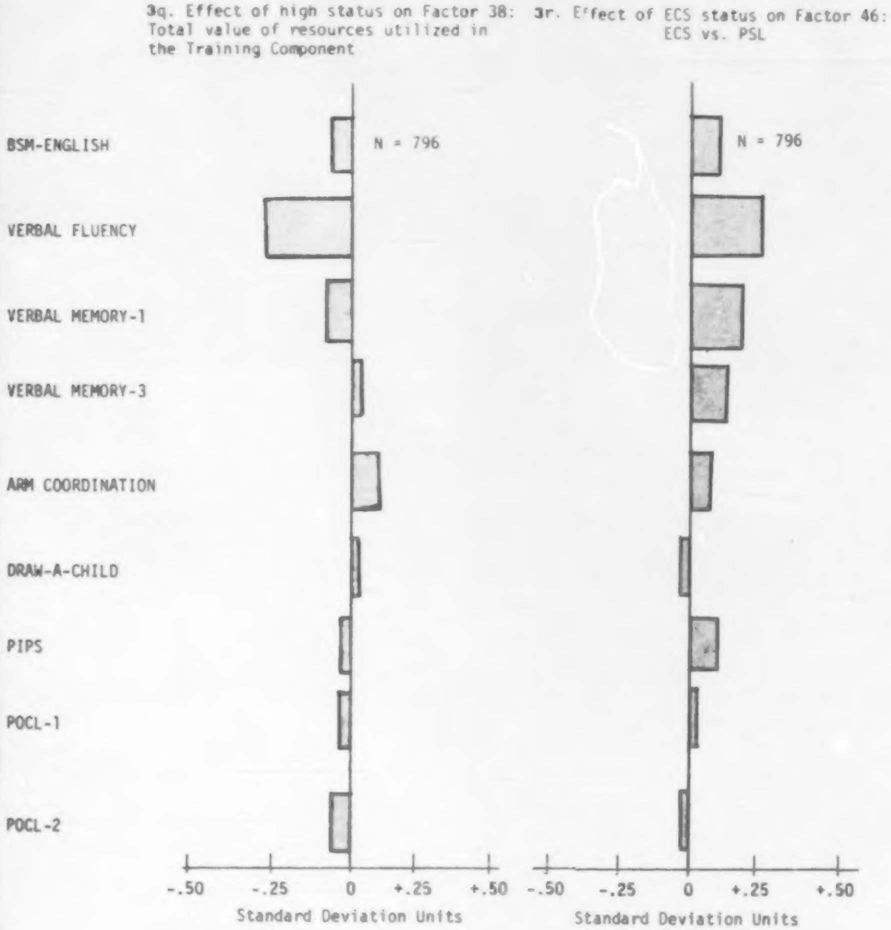
3o. Effect of high status on Factor 35: Total value of resources utilized in the Handicapped Services Component

3p. Effect of high status on Factor 37: Total value of resources utilized in the Administration Component

BSM-ENGLISH
VERBAL FLUENCY
VERBAL MEMORY-1
VERBAL MEMORY-3
ARM COORDINATION
DRAW-A-CHILD
PIPS
POCL-1
POCL-2
N = 796
N = 796
N = 796
N = 796
-.50
-.25
0
+.25
+.50
Standard Deviation Units
Standard Deviation Units
Standard Deviation Units
Standard Deviation Units

Note. The effects graphed represent differences between the mean standardized fall-to-spring "gain" scores of two groups: (1) the PDC and comparison children from sites high on the factor identified and (2) the PDC and comparison children from sites low on the same factor.

Figure 3
Effects of "Prominent" Educational Environment Factors on Adjusted Spring Test Scores of PDC and Comparison Children (English-Dominant Analytic Sample)



Note. The effects graphed represent differences between the mean standardized fall-to-spring "gain" scores of two groups: (1) the PDC and comparison children from sites high on the factor identified and (2) the PDC and comparison children from sites low on the same factor.

Table 24

Classification of Prominent Educational Environment Factors by Direction of Effect

Relationship to Children's Cognitive Performance	Mean Effect for the Six Cognitive Measures[a]	Mean Effect for the Remaining Three Measures[b]
POSITIVE		
1. % Noninvolved	+.07	-.09
5. % Peer Interaction	+.10	+.07
6. Education-1 (O)	+.06	-.08
7. Education-2 (O)	+.10	-.03
8. Education-3 (O)	+.10	-.03
10. Education-1 (J)	+.11	+.06
11. Education-2 (J)	+.25	+.01
15. Education-Total (O)	+.08	-.02
22. Education-Total (J)	+.12	+.03
27. Bilingual Multicultural-Total (J)	+.13	-.02
35. Handicap Services-Total Resources	+.08	-.05
46. Program Model	+.07	+.01
NEGATIVE		
3. % Nonsocial	-.08	+.03
4. % Nonverbal	-.09	+.02
32. Developmental Support Services-Total Resources	-.08	+.03
34. Parent Involvement-Total Resources	-.13	.00
37. Administration-Total Resources	-.03	-.01
38. Training-Total Resources	-.04	.00

[a] BSM-English, Verbal Fluency, Verbal Memory-1, Verbal Memory-3, Draw-A-Child, PIPS.

[b] Arm Coordination, POCL-1, POCL-2.

Among the 18 educational environment factors whose main effects were judged prominent, there were six for which environment-by-group interactions proved statistically significant. But all of the interaction effects had associated canonical correlations that were below the practical criterion level of .22; thus all were deemed negligible. This means that in no case was a factor found to be effective only for the PDC group. Every factor with an effect worth noting was about equally effective for PDC and comparison groups alike.

Conclusions

About 40 percent of the educational environment factors examined were found to bear a significant (according to our criterion of practical significance) relationship to children's test performance. Most of those that bore a positive relationship had to do with implementation of PDC education component Guidelines. Yet at the same time the analyses indicate that the PDC and comparison groups within individual sites share the same environment, at least at the Head Start level. This evidence leads to the inference that, at this point, a site's status with regard to the PDC education guidelines may have little to do with the influence of PDC. Instead, it may be more a consequence of already existing site conditions; if so, then it is these native conditions whose effects[1] are reflected in the Head Start children's test performance.

The effects discovered are not large, though. They are on the order of .10 standard deviations for each of the six cognitive tests. That is, if this analysis is correct, the effect of moving from a low to a high level of a positive educational environment factor is to raise Head Start children's scores on each of the six tests by about one tenth of a standard deviation. Another way of conveying a sense of the effect is to say that when the means of two groups are separated by an interval of this size, about 54% of the children in the higher group will be above the mean of the lower group (or 54% of the children in the lower group will be below the mean of the higher group).

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[1] The word "effect" has been used in this report in its conventional statistical sense, which has a presumptuous ring to it. The term "relationship" more accurately describes connections between two phenomena when it is uncertain whether the first causes the second, the second causes the first, or the two are caused by some third phenomenon.

In sum, these analyses suggest that many of the dimensions of the educational environment that were examined do play a role in children's test performance. (At the same time, it must be remembered that no single factor seems to play more than a modest role.)

Since most of these dimensions were defined in the first place by the PDC *Guidelines*, the findings that the effects of many are significant suggests that the *Guidelines* have succeeded in identifying some meaningful aspects of the educational environment. However, judging by the evidence, PDC has not yet begun to *shape* these aspects of the environment at the Head Start level; if there are differences between the educational environments that surround PDC and comparison Head Start children, these differences did not manifest themselves in our analyses. As to whether there may be differences at the elementary school level between PDC and comparison environments, there is currently no evidence available to permit a conclusion to be drawn. It will be possible to address this question in the future, however, if process or implementation data are collected at the comparison schools.

V

SUMMARY

This report has described the collection and analysis of fall and spring data from PDC and comparison children who entered Head Start in fall 1976 (Cohort 2). This is the group of children who will be followed through third grade if the PDC study is extended. Findings focused on characteristics of the sample, characteristics of the instruments, analysis of program effects, and analysis of relationships between program implementation and impact.

Characteristics of the Sample

Analysis of sample characteristics confirmed findings reported at earlier stages of the evaluation: the PDC and comparison groups were highly comparable in their demographic characteristics and test scores as they entered the study in fall 1976. Furthermore, the 12% attrition that occurred from fall to spring has not altered the group comparability, and each group still reflects the characteristics of the original sample.

Characteristics of the Instruments

Although the instruments used in 1976-77 had already passed several screenings to determine their suitability, they were re-examined on the basis of this year's data. All analyses confirmed the earlier conclusions: the tests' internal consistency coefficients meet the reliability criterion that was applied in the past; the measures are acceptably sensitive to fall-to-spring change; the factor structure of the battery reflects the domains the measures were intended to assess; and the tests appear to provide measures that are empirically relevant to social competence.

Analysis of Program Effects

The effects of PDC on the progress of Head Start children from fall to spring were examined using eight tests, a rating scale completed by testers, a rating scale completed by teachers, and measures of height and weight. Differences in spring 1977 scores of PDC and comparison children were examined after removing the potential influence of several extraneous factors (status in fall 1976, sex, ethnicity, prior preschool experience and site-specific influence). Analyses were carried out separately for the 888 English-dominant children and the 81 Spanish-dominant children; results were roughly the same for both samples.

Analyses of the effects of PDC showed that there is little difference *in general* in the gains made by the PDC and comparison children during the Head Start year. Nor is there any evidence so far to suggest that PDC has affected the gains made by any *subgroup* of children. That is, it can't be said at this point that PDC is effective for one sex, or one ethnic group, or one set of sites, or children with earlier preschool experience but not for others: no differential effects were found across these categories:

The judgments a reader makes on the basis of these results will vary depending on what the reader initially expected of PDC. Some would expect an ambitious program like this one to produce an immediate impact on children during their Head Start year. But others are likely to expect that PDC's effects will be realized only gradually, as each year of program experience builds continuously on preceding years. There are many persuasive arguments for the view that PDC's effects are unlikely to be visible this early but should become increasingly visible during the elementary years. In fact, it could even be maintained that the conclusion of no year-end difference between groups simply reaffirms the earlier finding that the PDC and comparison groups are very similar in makeup: not only were the children alike in their status at the time they entered PDC in fall 1976, they are also alike in the rate of learning shown over the Head Start year.

So at present it seems reasonable to draw two conclusions: first, the PDC and comparison groups remain essentially identical at the end of the Head Start year. And second, this result does not mean that PDC is ineffective, only that its effectiveness cannot be demonstrated at this early stage in the program. In the next phase of the evaluation, when the effects of continuity can be expected, it will be possible to provide more definitive answers about PDC's impact on children's performance.

Relationships Between Program Implementation and Impact

Although it may be unrealistic to expect any program to produce strong effects on children in one year, this phase of the PDC evaluation provided an opportunity to explore an analysis procedure for investigating relationships between implementation and impact. It was found that a number of characteristics of the children's educational "environment," as reflected in variables from the Cost Study, the Implementation Study and the Classroom Observation System, did indeed relate to the gains children achieved on the performance measures. In general, tests of cognitive ability reflected these influences more than the tests of psychomotor or social abilities did, with elements related to PDC's education requirements being most positively associated with cognitive test performance. Because of the preliminary nature of these analyses, however, it is premature to conclude that the PDC program has actually caused the changes--conditions already existing in the Head Start programs could account for the relationships that were found.

A Final Comment

The PDC Impact Study has accomplished most of its objectives for the first phase of an anticipated long-term study that would follow children from Head Start through third grade. One major shortcoming of the study to date is the fact that measures of PDC's effects on participating teachers and parents have not been possible because of delays in the Office of Management and Budget's forms clearance process. The next phase of the study will certainly be strengthened by the inclusion of measures appropriate for assessing these important aspects of the program's impact.

APPENDIX A

DESCRIPTION OF THE MEASURES IN THE BASIC SPRING BATTERY

	Order of Administration[1]
• **Social-Emotional Measures**	
PDC Classroom Observation System	1
Preschool Interpersonal Problem-Solving Test (PIPS)	6
Pupil Observation Checklist (POCL)	9
PDC Child Rating Scale	-
• **Psychomotor Measures**	
Arm Coordination [McCarthy Scales of Children's Ability (MSCA)]	8
• **Cognitive and Language Measures**	
Bilingual Snytax Measure (BSM)	2
Block Design (WPPSI)[2]	10
Verbal Memory (MSCA)	3
Verbal Fluency (MSCA)	5
Draw-A-Child (MSCA)	4
• **Other Measures**	
Adult Language Check	
Attrition and Attendance Information Sheet	

Each of these measures is described briefly below. For a more extensive review, see Interim Report II, Part B: Recommendations for Measuring Program Impact (1975).

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[1] As noted in the text, the battery was administered in one or sometimes two sessions.

[2] WPPSI serves as an index of general cognitive aptitude, and was administered as a baseline measure at all sites in fall 1976. It was administered at only four sites in spring 1977. This was for the purpose of estimating its test-retest stability and sensitivity to change.

PDC Classroom Observation System (High/Scope Foundation, unpublished). The PDC observation system was developed to provide information about children's classroom behavior along dimensions pertinent to the social-emotional goals of Project Developmental Continuity. The system focuses on aspects of an individual child's behavior, verbal or nonverbal, that reflect the child's attitude toward himself, and on the child's social competence as demonstrated in his interaction with peers and adults.

Using a time-sampling method, trained observers observe each child for five minutes at two different times during the day and code the observed behavior into four general categories: "noninvolved," "involved," "interacts with peer," and "interacts with adult." A fifth category, "activity level," is included to provide information concerning the context in which these behaviors were observed. Each of these categories includes subcategories that are designed to identify the frequency and nature of specific behaviors within the general category.

Preschool Interpersonal Problem-Solving Test (Shure and Spivack, 1974)[1]. The PIPS attempts to assess the child's ability to name alternative solutions to a life-related problem--that of obtaining a toy from another child. Paper cut-outs of boys, girls and toys are used in presenting the problem. Among inner city four-year-olds attending the Philadelphia Get Set day care program, those judged as better-adjusted by their teachers were able to conceptualize a greater number and a wider range of alternative solutions to real-life problems than were their more poorly adjusted classmates.

Pupil Observation Checklist (High/Scope Foundation, unpublished). This is a rating scale consisting of twelve 7-point bipolar adjectives derived from a similar scale used in the Home Start evaluation.[2] The tester rates each child using this instrument after he or she has administered all the other measures in the battery to the child.

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[1] Shure, M. B., & Spivack, G. The PIPS Test Manual. Philadelphia: Hahneman Medical College, 1974.

[2] Love, J., et al. National Home Start Evaluation Interim Report VII. Ypsilanti, MI: High/Scope Foundation, March 1976.

PDC Child Rating Scale (High/Scope Foundation, unpublished). This instrument is designed as a measure of social competence to be administered by the respective classroom teachers of the children rated. For each of the 39 items, specific behaviors such as "Uses words or wits to influence others" are rated on a 5-point scale according to frequency of occurrence ("Very frequently" to "Rarely").

McCarthy Scales of Children's Abilities (McCarthy, 1972)[1]. These subtests consist of a series of tasks tapping problem-solving, psychomotor, and conceptual abilities, and are similar to the Wechsler Scales, but with emphasis on age-related maturational indicators.

- Verbal Memory. The child is asked to repeat sequences of words (Verbal Memory-1) and to repeat or retell as much as possible of a one-paragraph story (Verbal Memory-3).
- Verbal Fluency. The child is asked to name as many members of specific categories (e.g., animals) as he/she can.
- Arm Coordination. Child bounces a rubber ball, catches a beanbag, and throws a beanbag through a hole in a target.
- Draw-A-Child. Child draws a picture of a child of the same sex.

Wechsler Preschool and Primary Scale of Intelligence, Block Design subtest (Wechsler, 1967)[2]. The task requires reproducing (constructing) designs with flat colored blocks, either from the examiner's model or from a picture on a card. The measure taps problem-solving abilities, flexibility of response style, visual-motor organization, and execution.

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[1] McCarthy, D. McCarthy Scales of Children's Abilities: Manual. New York: Psychological Corporation, 1972.

[2] Wechsler, D. Wechsler Preschool and Primary Scale of Intelligence: Manual. New York: Psychological Corporation, 1967.

Bilingual Syntax Measure (Burt, Dulay and Hernandez Ch., 1975)[1]. This test is designed to measure children's oral proficiency in English and/or Spanish grammatical structures. Simple questions are used with cartoon-type colored pictures to provide a conversational setting for eliciting natural speech. An analysis of the child's response yields a numerical indicator and a qualitative description of the child's structural language proficiency in standard English or standard Spanish. Responses are written down verbatim.

Adult Language Check. This measure is used in the bilingual/bicultural demonstration sites to obtain an indication of the languages the adults in the classroom use during their interactions with children. The interviewer sits in the classroom for a two-hour period and records the language used by the teachers and aides approximately every five minutes.

Height and Weight. All children are weighed and measured during the same two-week period in the spring.

The Spanish version of the Bilingual Syntax Measure was administered only to Spanish-speaking children, and the Adult Language Check was used only in classrooms where languages other than English were spoken by teachers, aides, or other adults.

Controlling for Order Effect in Administering the BSM to Bilingual Children

Children who show facility in both Spanish and English receive both versions of the BSM. The order in which the two versions are administered is controlled so that during any single testing period half the children receive the Spanish version first and half receive the English version first. Further, the order is reversed with the fall testing so that, for example, a child who received the Spanish version first in the fall would receive the English version first in the spring.

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[1] Burt, M., Dulay, H., & Hernandez Chavez, E. Bilingual Syntax Measure. New York: Harcourt, Brace, Jovanovich, 1975.

Appendix B

DEVELOPMENT OF THE PRESCHOOL PRODUCTIVE LANGUAGE ASSESSMENT TASK (PPLAT)

Robert D. Matz

The urgent need for instruments measuring children's productive language is felt especially by curricula in which language is valued as a means for the child to develop his own knowledge about the world by articulating his needs and ideas in day-to-day social interactions. Apart from the fact that available and frequently used instruments such as the Illinois Test of Psycholinguistic Abilities (ITPA) have conceptual and methodological shortcomings, these tests also use a measurement situation in which the child's role is primarily passive and restricted. In contrast, during the High/Scope Preschool Productive Language Assessment Task (PPLAT) both the child and the tester have an opportunity to initiate purposeful communication focusing upon objects of real interest to the child.

Considering the area of bilingual language assessment, the lack of instruments tapping expressive language is very apparent. Since it is this type of language competence--as much or more than standard grammatical usage--that is of concern to bilingual educators, the PPLAT promises to make a necessary contribution to bilingual education.

The development of an innovative assessment procedure is a complex endeavor requiring a sizable time-frame. Fortunately, the High/Scope Foundation has been able to take advantage of opportunities for cross-project collaboration. To begin, the PPLAT is intended to be an analogue of a measure of elementary school children's productive language abilities developed by High/Scope with the support of Project Follow Through. In addition to work within the context of PDC, we have conducted instrument-development activities in a BEH-funded demonstration project and have profited from in-house consultation with a language assessment project funded by the the Carnegie Corporation of New York and with bilingual language specialists working with the High/Scope Bilingual/Bicultural Curriculum Development Project funded by the Administration for Children, Youth and Families.

The Measurement Situation

In the BEH project we began exploring measurement situations during 1974-1975 in which the child was asked to recall how or what he had just done during "worktime" or to describe familiar objects. These situations were unsuccessful in eliciting complex language. This seemed to be true both because preschool children, especially 3-year-olds, are easily discomforted by direct attempts to elicit verbal communication (cf. Tough, 1977) and because they typically do not possess the cognitive organization necessary for reporting or narrating tasks. (Additionally, the analysis of "natural language" samples obtained through unobtrusive classroom observations seemed unfeasible given technical difficulties in obtaining language records and the need for extended, repeated observations to obtain representative samples of the language of individual children.)

The problem is how to set up a situation in which there is some real reason for the child to stretch his language abilities to their utmost. How can we be reasonably sure that the child will place a high priority on verbal communication?

During 1975-1976, in the BEH project and at the Connecticut and Iowa PDC sites we employed a diversified measurement situation in which most children were comfortable and interested. On a long, low table was spread a cafeteria of materials: novel toys amenable to mechanical exploration and social-dramatic play, familiar construction and art materials from the classroom and a picture book without words. Children came individually with an interviewer to work with these materials for approximately 30 minutes.

Two experienced testers at each site conducted the PPLAT interviews. Training consisted of a presentation of the PPLAT guidelines, distribution of some written notes, and the demonstration of one child engaging in the PPLAT.

To assure that the language records obtained would reflect language production rather than imitation, the amount of language modeled by the interviewer was minimized. When necessary, the interviewer established rapport with the child by engaging in tangential play. The interviewer structured the situation by asking at appropriate moments one of a number of divergent questions (e.g., "Can you tell me more about that?") and sometimes by moving the child from one activity to another (e.g., by opening a picture book). The language of both interviewer and child was tape recorded.

During the subsequent year, we made certain improvements in the measurement situation, hoping to elicit more elaborated comments and observations from the children. The most important change was to use materials that could easily by integrated in one dramatic play scenario: a Playschool bus with little people, Playschool blocks, a large cardboard box with doors and windows cut out, and a little car. Another feature of these materials was that they can be used in many different ways. For instance, the box can be used to represent a home, school, store, etc. Alternate "back-up" items were available for children who were not interested in these materials. Back-up items included a picture book without words (Look and Laugh by R. Pierce), a peg board and crayons. (For children who were interviewed in two languages, an alternate set of similar materials was used for the second measurement situation.)

The language interviews were conducted by four bilingual testers, one of whom had previous testing experience. Two High/Scope staff members spent three days at the Texas site training these testers. Training involved distribution and discussion of a manual, demonstrations by the trainers, and practice by the trainees administering the PPLAT to children, with observation and feedback by the trainers.

Each session commenced with a 5 minute warm-up period to help the child feel relaxed and to convey the message that it was legitimate and desirable to converse with the adult. Since language from this period was not scored, there were no limitations on what the interviewer could say. During the warm-up, Play-doh and clay hammers are used. The interviewer manipulated some of the doh, showing enthusiasm, and making sure to model the types of actions with the Play-doh that are at the level of the child's action. If the child was not talking, the interviewer used a lot of "self-talk" about what s/he was doing (e.g., "I'm going to roll it now, and then I'm going to put these two together.").

The interviewer began the measurement situation by putting out the materials on the table (or on the floor) in prearranged locations, saying, "Here are some more toys we can play with" while rolling the bus around in front of the child. From here on, the tester had a series of prompts that could be used when the child either did not respond by talking or seemed to be losing interest. These prompts were open-ended questions that related to the dramatic scenario. For instance, a beginning prompt consisted of taking a little person and "walking it," saying, "I need a ride. Will someone give me a ride?"

The interviewer needed to be sure to give the child a chance to respond before going to another prompt, waiting as long as 2 minutes for the child to start verbalizing. Of course, the child sometimes generated his own agenda in which these particular prompts were not applicable. When this happened, the interviewer attempted to set the stage for open questions, often by encouraging the child to help the two of them engage in activities together.

Child	Adult
Can you hold this and make this?	
	Where do you want me to put it?
Put that in the middle of . . . in the hole.	
	In the middle of the hole.
Put it right over the bottom in your house.	

In addition to these prompts, the tester also used acknowledgements and comments such as exact repetitions of what the child had said (with added emphasis) and phrases such as "My, my", "Oh, I see", and so forth. The purpose of acknowledgements and comments was to render the setting more natural.

Spanish and English Administration

The first time the PPLAT was used in two languages was in spring 1977. The PPLAT was administered in Spanish to 60 children at the Texas site. Fifteen of these children who were bilingual were also assessed by the PPLAT in English. The interviewers were instructed to speak with the child only in the language the child was being assessed in, and the interviewers were instructed to feign ignorance of any other language the child might use. The purpose of this procedure was to increase the child's motivation to use the target language. For those children who were administered both the English and Spanish versions of the PPLAT, a different interviewer worked with the child in each language. The order of administration of Spanish and English was counterbalanced, and at least one week intervened between the two tasks.

Critique of the Measurement Situation

The measurement situation we have used is designed to be a concentrated replica of the types of teacher-child interactions that occur in many successful early childhood classrooms. Therefore a good interviewer, or "tester," needs to have some of the same skills as a proficient teacher. This concept is somewhat revolutionary, and it is not clear how far it can be taken. Currently, many educators are noticing how curricula are shrinking to fit the contents of tests. We are proposing that language assessment be expanded to meet the goals of curricula.

The results from the High/Scope BEH-funded demonstration project show that the language produced during the present version of the PPLAT is at least as complex as the language produced by children in the classroom environment. Thus, we are confident in the capacity of the PPLAT measurement situation to evoke representative samples of children's productive language. Future instrument development efforts must determine whether the open structure of the measurement situation is feasible for use in summative evaluations.

PPLAT Language Analysis Variables

The PPLAT variables obtained by coding the transcribed language samples consist of five primary variables and a larger number of second-order variables. The primary variables are as follows:

- S-unit. In our system this unit represents the smallest independently meaningful expression of thought.

    Complete S-units. A complete S-unit is a single independent predication (subject + verb + object if verb is transitive) together with any subordinate clauses or phrases that may be grammatically related to it. (The complete S-unit is identical to the T-unit described by Hunt, 1965.)

    Incomplete S-unit. These units contain an explicit subject and an implicit predicate, or vice versa. Incomplete S-units are not grammatically coherent without reference to the ongoing context of the conversation. However, they are entirely appropriate in certain communicative contexts. For instance:

Tester - "You think he's going to fall out?"
Child - "Fell out."

- Responsive S-units and Initiated S-units. This distinction is based upon judgment of who is in control of the conversation. The child may be in the position of responding to the tester or taking the conversational initiative.

  Initiated S-units. These units may be thought of as representing spontaneous, child-governed speech. Also, if when following a prompt, the child changes the subject, the speech is scored as "Initiated."

  Responsive S-units. These units may be thought of as compliant, interviewer-governed speech. They usually follow open-ended questions by the tester.

  Tester - "What is she doing?"
  Child - "She's going swimming." (Responsive)
  Child - "I go swimming sometimes." (Initiated)

- Speaking Turns. A speaking turn may be thought of as a continuous flow of speech. Every cluster of S-units not interrupted by a meaningful interjection from the tester or by a distinct pause is coded as a speaking turn.

From these categories we have constructed a number of second-order variables. For the purpose of economy, only some of these will be discussed in this report. These include:

- Average Length of Speaking Turn. This is obtained by dividing the total number of words by the total number of speaking turns.

- Number of S-units per Speaking Turn. This is obtained by dividing the total number of S-units by the total number of speaking turns.

- Proportion of Complete S-units. This is obtained by dividing the total number of Complete S-units by the total number of S-units.

- Proportion of Initiated S-units. This is obtained by dividing the total number of Initiated S-units by the total number of S-units.

- Average Length of S-unit. This is a rough estimate of the syntactic maturity of an utterance. It is obtained by dividing the total number of words in the language sample by the total number of S-units.

- Vocabulary Diversity. (This variable is not based upon the general categories listed above.) It is computed by the following formula, the purpose of which is to adjust for the length of the language sample:

  $$= \frac{\text{number of different words}}{2(\text{number of decodable words})}$$

  Vocabulary Diversity is known in the linguistic literature as "Type/Token Ratio." It has the advantage of being unbiased toward any particular type of vocabulary.

- Descriptive Diversity. We believe with other researchers (cf. Bloom, 1975) that the occurrences of descriptive words and constructions in language are indicative of underlying cognitive structures. We tap these occurrences with a measure of Descriptive Diversity:

  $$= \frac{\text{number of different descriptive words}}{2(\text{number of descriptive words})}$$

Other second-order variables are based upon categories of supporting detail words including:

- classification
- subjective modifiers
- space words
- time words
- seriation words
- physical quantity words
- number words
- expression of class relationship
- transformation-combination words.

Critique of PPLAT Variables

The current PPLAT language analysis variables are serving as place holders until we are able to develop more interpretable measures. That is, the variables now in use are assumed to be indirect indices of other more specific and informative qualities of purposeful communication. For instance, Average Length of S-unit is an indirect measure of children's capacity to use complex syntactic structures in the service of communication. And the construct validity of this measure rests on the widespread finding that it increases with age and that there is a correspondence between mean length and the appearance of specific grammatical features such as auxiliaries (Cazden, Bond, Epstein, Matz and Savignon, 1977). However, it would be preferable to measure communicative effectiveness more directly so that more meaningful conclusions can be made.

Analysis of the PPLAT results from 1976 revealed that three of the measures overlapped so much as to be practically redundant. These highly intercorrelated measures were Average Length of S-unit, Proportion of Complete S-units, and Proportion of Initiated S-units. Because there are significant costs associated with coding these variables, coding was discontinued on the latter two variables.

The Process of Textual Analysis

After the transcription of the audio tapes, textual analysis has been performed by staff who have already been trained to analyze similar variables for the written language of older children. The scoring procedure involves a computer program and is performed at computer terminals. We have not attempted to determine scoring reliability. We assume the reliability would exceed .9 because this level of consistency has been achieved in using identical rules to score the transcripts of older children.

PPLAT Results

In this section results pertinent to continued use of the PPLAT in the PDC evaluation are described. The analyses have focused primarily on methodological concerns (especially on the precision of the diversity measures and internal consistency), correspondence of results from Spanish- and English-language samples, and concurrent validity. Although both PDC and comparison children were included in the sample, no analyses of group differences were made since the samples are small, the procedures are exploratory, and major differences at the Head Start level are not expected at the Texas site.

Methodological Concerns

Precision of diversity measures. Diversity measures are ratios of the number of different elements of some type in a language sample to the total number of elements of the same type. If these ratios are unadjusted, they favor individuals with shorter language samples. This bias exists because the less language one produces, the less likely it is that the same element will be repeated. We have used a mathematical adjustment to compensate for this artifact, but we have discovered that the adjustment (multiplying the denominator of the ratio by 2 and using the square root of the product) actually overcompensates and favors individuals with longer samples.

To investigate this problem, we examined diversity scores calculated separately for sub-samples of lengths beginning with 50 words and increasing by 50 word increments to 1250 words (e.g., 50, 100, 150, etc.). If the correction were working, the average diversity score for the group should have been approximately the same no matter the length of the sample from which the scores were computed. In fact, the scores increased as the sample size increased. This increase was more pronounced for Descriptive Diversity than for Vocabulary Diversity. Accordingly, we have become dissatisfied with the current method of calculating the diversity variables, and we plan to devise other ways of measuring the constructs.

Internal consistency. The issue of the degree of internal consistency within the PPLAT samples touches both cost-oriented and psychometric considerations. From a psychometric viewpoint, internal consistency is an indicator of the reliability of the procedure. From a cost viewpoint, satisfactory internal consistency permits one to reduce the size of the language corpora that are analyzed, thereby lowering costs associated with transcription and scoring.

In order to determine whether abbreviated language samples provide scores that are representative of the entire sample, part-whole and part-part correlations could be examined. Part-whole correlations are useful in describing the overall association between sub-samples and entire samples, but these correlations are always biased because the part sample is included within the whole sample. In principle, part-part correlations (such as the first 50 S-units correlated with the last 50, the first 100 with the last 100, etc.) could avoid this problem, but the PPLAT language samples are not sufficiently large to permit non-overlapping sub-sections. Therefore, the Spearman Brown formula (Guilford and Fruchter, 1973, pp. 414-416) was used to predict part-part reliabilities from one non-overlapping correlation--the correlation of the first 50 S-units with the last 50. These estimated reliabilities are shown in Figure B-1 for three key variables. It can be seen that the reliabilities increase considerably as the size of the language sample (in S-units) increases. For variables such as Average Length of S-unit, which has a moderately high reliability even with 50-unit samples, increasing the sample size over 150 S-units would not substantially increase the measurement reliability; for variables such as Vocabulary Diversity, however, reliability continues to increase even with samples sizes of 200-250 S-units.

Taking into account the fact that the structure of the PPLAT is more open than the structure of standard tests, we assume that these estimates of reliability are acceptable, especially for overall comparisons of one group of children with another. The higher reliability for Average Length of S-unit than for Vocabulary Diversity says something about the interaction between situational demands and language competence. Apparently, different situations during the PPLAT, involving different materials and purposes, require more diverse vocabulary than others, while the syntactic complexity elicited by the PPLAT appears to be relatively constant throughout internal variations in each measurement situation.

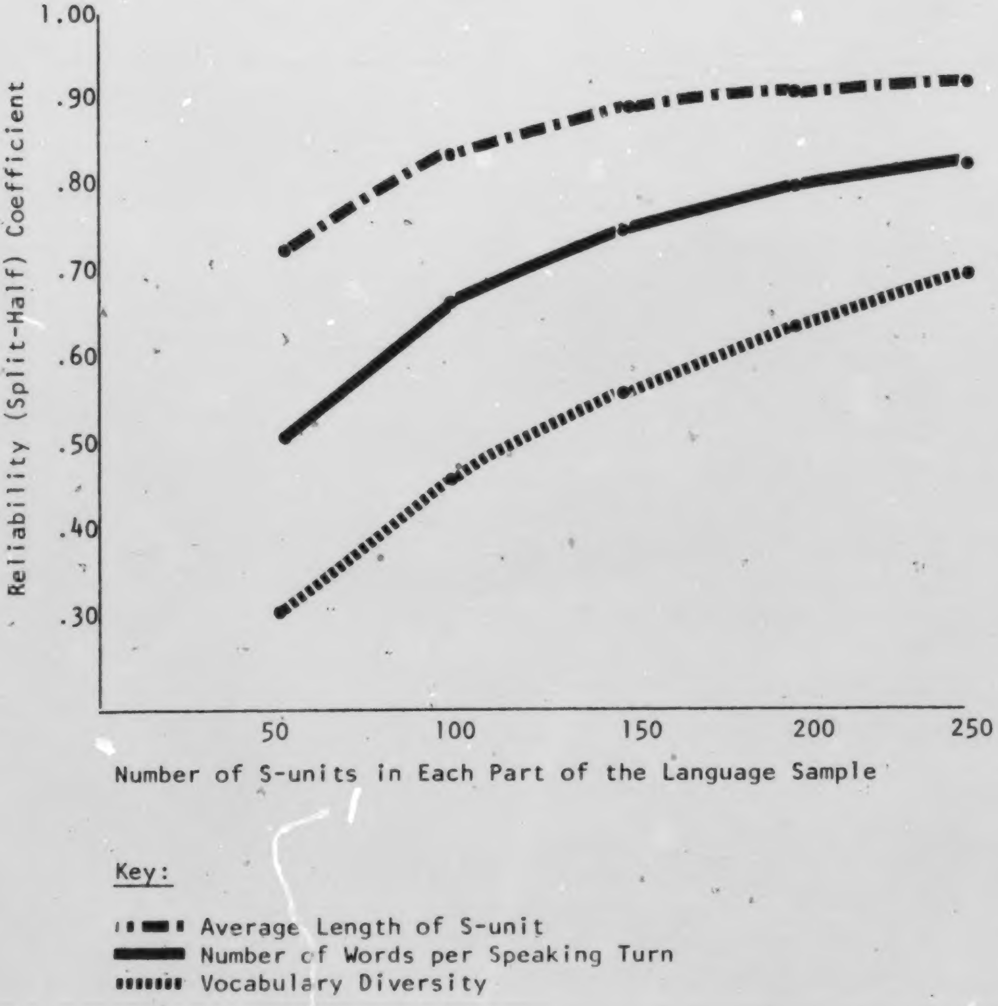
For analyzing the spring 1977 PPLAT data, a minimum sample size of 100 S-units was decided upon. The sample size actually varied across children since coding was continued until a speaking turn was completed. After deleting the first 10 S-units (to allow for warm up), coding was continued to the end of a speaking turn at the point where the child had produced at least 100 S-units.

Correlations Between Spanish and English PPLAT Scores

On the basis of BSM scores in Spanish and English, 15 children were selected from the Texas site to receive the PPLAT in both languages. Significant correlations ($p < .05$) between English and Spanish PPLAT scores were found for three variables--Average Length of S-unit ($r = .67$), Average Length of Speaking Turn ($r = .67$), and Number of Words per Speaking Turn ($r = .59$). All of these variables measure the "load" that children can carry mentally in a single unit of speech. That is, Average Length of S-unit is an index of the grammatical load of each utterance, while the other two variables index the ideational load of each speaking turn.

Figure B-1

Estimated Reliability Coefficients for Three PPLAT Variables, Based upon Actual Correlations Between the First and Last 50 S-units in Each Language Sample



Given this logical commonality among these variables, we hypothesize that general cognitive skills, which remain the same when the child is speaking either language, account for the significant correlations. In contrast, children's competence to use diverse vocabulary items may be much more affected by language-specific experiences.

Even though these correlations do not represent a typical test-retest situation, the significant correlations do suggest a high degree of stability in these key PPLAT variables.

Concurrent Validity

Task analyses of certain tests in the PDC battery reveal some of the same skills necessary for obtaining high scores on the PPLAT. For example, successful performance in Verbal Memory-3 requires a relatively wide vocabulary, and breadth of vocabulary is certainly tapped by the PPLAT Vocabulary Diversity measure. Accordingly, we expected to obtain moderately strong relationships between PPLAT variables and other variables in the PDC battery.

Correlations obtained in 1976. As shown in Table B-1, a number of significant relationships were found in the first administration of the PPLAT. The positive correlations are self-explanatory. The negative correlations between teacher ratings of Achievement Motivation (SC-4) and Proportion of Initiated S-units and Number of S-units per Speaking Turn suggest that children who were not responsive to the interviewers prompts and questions during the PPLAT also were not judged by their teachers to demonstrate achievement motivation in the classroom environment.

Correlations obtained in 1977. During 1977, the PPLAT was administered in Spanish to 60 children and in English to 48 children. Fifteen of these children were truly bilingual so they received the PPLAT in both languages (with a one-week interval). Fifty-two children were in the PDC Head Start program and 56 were in comparison group.

The pattern of significant correlations with other PDC measures was not similar to the pattern for 1976 either in the Spanish or English PPLAT samples. (Variables derived from teacher's observations were not included because teachers did not complete the ratings in Texas in 1977.) In particular, there were no significant correlations between the PPLAT diversity measures and Verbal Memory, nor were Average Length of S-unit and the BSM significantly correlated. Further, the

Table B-1

Significant Relationships Between Key PPLAT Variables and Other Child Measures, Spring 1976

	Key PPLAT Variables				
Other Child Measures[1]	Proportion of Initiated S-units *(N)*	Average Length of S-unit *(N)*	No. of S-units per Speaking Turn *(N)*	Descriptive Diversity *(N)*	Vocabulary Diversity *(N)*
SC-4: *Achievement Motivation*	-.49** *(32)*		-.35* *(32)*		
SC-7: *Extroversion*	.56*** *(32)*				
SC-9: *Maturity*				.45** *(32)*	.36* *(32)*
Bilingual Syntax Measure		.30* *(45)*			
Verbal Memory-3				.64*** *(39)*	.61*** *(39)*

* $p < .05$
** $p < .01$
*** $p < .001$

---

[1] Variables from the teacher-completed Child Rating Scale and tester-completed POCL in 1976.

pattern of significant correlations was different in the Spanish and English groups. For Spanish-speaking children, Average Length of S-unit was most highly related to other measures, while for English speakers the same was true for Vocabulary Diversity. (Correlations are shown in Table B-2.)

Another unexpected outcome was the lack of a single correlation greater than .60. Correlations of this magnitude have been obtained consistently with a smaller sample size in the BEH-funded High/Scope Demonstration Project and were found in the 1976 PDC results. What is the explanation for these discrepancies? We largely have ruled out the idea that the adult interviewers introduced extraneous variation in the measurement situations because of the correlations between Spanish and English variables and because close inspection of the PPLAT transcripts showed that the interviewers followed appropriate procedures.

Recommendations for Continued Development of the PPLAT

The fact that within each set of language samples there are significant correlations with other PDC measures means that the PPLAT does possess concurrent validity. Estimates of the content validity of the PPLAT depend largely upon the values of educators and educational policy makers. The PPLAT clearly represents an alternative approach to measuring features of language competence, but a number of concerns require consideration:

- Currently the PPLAT is expensive, with considerable time required for testing, transcribing, coding and data analysis. It may be possible to reduce these costs by devising new variables that do not require the computer for calculation or transcription prior to coding (for instance, a rating scale of the child's ability to respond to particular types of questions).
- As mentioned previously, there is a need to develop more directly interpretable variables.
- An attempt should be made to determine whether educators and policy-makers would be willing to accept the lack of standardization in the measurement situation.

Table B-2

Significant Relationships Between Key PPLAT Variables and Other Child Measures, Spring 1977
English Language

Other Child Measures	Vocabulary Diversity *(N)*	Descriptive Diversity *(N)*
BSM-English	.54*** *(34)*	.39* *(34)*
Verbal Memory-1	.50** *(33)*	--
PIPS	.38* *(36)*	--
POCL-total	.37* *(36)*	--

* p < .05
** p < .01
*** p < .001

Table B-3

Significant Relationships Between Key PPLAT Variables and Other Child Measures, Spring 1977
Spanish Language

Other Child Measures	Average Length of S-unit *(N)*	Vocabulary Diversity *(N)*
BSM-Spanish	--	.30* *(48)*
Verbal Memory-3	.30* *(49)*	--
Draw-A-Child	.40** *(49)*	--
PIPS	.59*** *(52)*	--

* p < .05
** p < .01
*** p < .001

- Perhaps the most fertile ground for further PPLAT development would be in the area of bilingual assessment; one of the PPLAT's chief virtues is that it provides a context for eliciting language that is more conducive to producing valid representations of the child's competence than typical standardized tests.

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APPENDIX C

ANALYSES OF VARIANCE AND COVARIANCE AND GROUP MEANS FOR EACH MEASURE IN THE BASIC BATTERY

Each of the following tables is presented in two parts: the first is a standard summary of the results of the statistical procedure performed (analysis of variance or covariance) and the second is a display that allows reconstruction of mean scores for each level of each analytic factor. This second part of the table shows:

- the mean score on the dependent variable for all members of the sample ("GRAND MEAN"),
- the number of children's test scores associated with each level of each factor ("N"),
- the deviation from the grand mean of the mean score obtained by children at each level ("UNADJUSTED DEV'N"),
- the deviation from the grand mean of each level's mean score after adjustment for the effects of the covariate and preceding factors ("ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N"); this represents the magnitude of the factor's effect apart from the effects of the covariate and preceding factors.

Example

The second page of Table C-1 (for BSM-English) shows that under the first design factor, "SEX," the scores of 436 males and 446 females entered into the analysis. The values representing their scores on BSM-English are:

	Grand Mean	Unadjusted Deviation	Adjusted Deviation
Male	10.32	-.29	-.09
Female		+.28	+.09

Thus the mean scores of each group can be reconstructed in the manner shown below.

	Grand Mean	+	Deviation	=	Mean for Group
Unadjusted Scores					
Males:	10.32	+	(-.29)	=	10.03
Females:	10.32	+	(+.28)	=	10.60
Adjusted Scores					
Males:	10.32	+	(-.09)	=	10.23
Females:	10.32	+	(+.28)	=	10.41

Adjusted scores such as those shown above are the values that actually enter into a test of the significance of a difference. Ordinarily, meaning is attached only to differences that reach a criterion level of statistical significance. The criterion used for the analyses reported here was a value of .05 or less. Note in the first page of Table C-1, under "SIGNIF OF F," that the significance value associated with the difference between adjusted BSM-English scores of males and females, shown in the example above, is .[illegible]74--nonsignificant according to the criterion used here. Conventionally, the appropriate interpretation is that the difference is due simply to chance, not to any dependable distinction between boys and girls like those in the sample.

Table C-1

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: BSM-English *(N = 882)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
              V4001     RSM-ENGLISH.E.S77
           BY SEX       MIDASV11
              ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
              PRFSCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V3001     BSM-ENGLISH.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                      SUM OF                MEAN            SIGNIF
SOURCE OF VARIATION                  SQUARES      DF       SQUARE       F    OF F

COVARIATES                          6647.727       1    6647.7271088.739  0.0
   V3001                            6647.727       1    6647.7271088.739  0.0

MAIN EFFECTS                        1340.563      18       74.476  12.197  0.000
   SEX                                11.305       1       11.305   1.851  0.174
   ETHNIC                            484.410       4      121.103  19.834  0.000
   PRESCHL                            80.543       1       80.543  13.191  0.000
   NEWSITE                           755.883      11       68.717  11.254  0.000
   NEWGROUP                            8.422       1        8.422   1.379  0.241

2-WAY INTERACTIONS                   550.363      72        7.644   1.252  0.084
   SEX       ETHNIC                   52.981       4       13.245   2.169  0.071
   SEX       PRFSCHL                   5.082       1        5.082   0.832  0.362
   SEX       NEWSITE                  57.278      11        5.207   0.853  0.587
   SEX       NEWGROUP                  1.059       1        1.059   0.173  0.677
   ETHNIC    PRESCHL                  23.514       4        5.878   0.963  0.427
   ETHNIC    NEWSITE                 183.942      26        7.075   1.159  0.267
   ETHNIC    NEWGROUP                 34.680       4        8.670   1.420  0.225
   PRESCHL   NEWSITE                  92.137      10        9.214   1.509  0.131
   PRESCHL   NEWGROUP                 19.330       1       19.330   3.166  0.076
   NEWSITE   NEWGROUP                 71.330      10        7.133   1.168  0.309

EXPLAINED                           8538.652      91       93.831  15.367  0.0

RESIDUAL                            4823.656     790        6.106

TOTAL                              13362.309     881       15.167
```

Table C-1
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                 V4001      BSM-ENGLISH.E.S77
          BY     SEX        MIDASV11
                 ETHNIC     MIDASV12:ETHNIC CLASSIFICATION
                 PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
                 NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
                 NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH   V3001      BSM-ENGLISH.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     10.32                                             ADJUSTED FOR
                                                                   INDEPENDENTS
                                              UNADJUSTED           + COVARIATES
VARIABLE + CATEGORY                  N        DEV'N                DEV'N

SEX
     1 MALE                         436        -0.29                -0.09
     2 FEMALE                       446         0.28                 0.09

ETHNIC
     1 BLACK                        355        -2.25                -0.46
     2 HISPANIC                     160         1.09                 0.07
     3 INDIAN,NATV ALASKAN           17         1.56                 0.45
     4 ANGLO                        332         1.94                 0.52
     5 ASIAN                         18        -2.60                -1.56

PRESCHL
     1 YES                          127        -2.48                 0.19
     2 NO                           755         0.42                -0.03

NEWSITE
     2 CALIFORNIA-ENGLISH            50         1.28                -0.04
     4 COLORADO                      70         2.21                 1.08
     5 CONNECTICUT                   91        -1.48                -0.18
     6 GEORGIA                       40        -1.62                -0.29
     7 FLORIDA                       70        -5.93                -3.40
     8 IOWA                          88         0.69                 0.39
     9 MARYLAND                      65        -0.03                 0.78
    10 MICHIGAN                     104        -2.11                -1.18
    12 TEXAS-ENGLISH                 41         2.63                 0.85
    14 UTAH                         106         2.41                 0.91
    15 WASHINGTON                    97         0.54                 0.54
    16 WEST VIRGINIA                 60         2.35                 0.80

NEWGROUP
     1 PDC                          470        -0.08                -0.09
     2 COMPARISON                   412         0.09                 0.11
```

Table C-2

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: WPPSI-English *(N = 351)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
            V4003      WPPSI.E.S77
         BY SEX        MIDASV11
            ETHNIC     MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3003      WPPSI.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                   SUM OF               MEAN              SIGNIF
SOURCE OF VARIATION               SQUARES      DF      SQUARE       F      OF F

COVARIATES                       2575.688       1    2575.688  228.917   0.000
   V3003                         2575.688       1    2575.688  228.917   0.000

MAIN EFFECTS                      237.944      10      23.794    2.115   0.023
   SEX                              5.907       1       5.907    0.525   0.469
   ETHNIC                          30.004       4       7.501    0.667   0.616
   PRESCHL                         61.801       1      61.801    5.493   0.020
   NEWSITE                        137.152       3      45.717    4.063   0.007
   NEWGROUP                         3.079       1       3.079    0.274   0.601

2-WAY INTERACTIONS                436.253      34      12.831    1.140   0.278
   SEX       ETHNIC                82.698       4      20.674    1.837   0.122
   SEX       PRESCHL               15.495       1      15.495    1.377   0.242
   SEX       NEWSITE               60.233       3      20.078    1.784   0.150
   SEX       NEWGROUP               0.267       1       0.267    0.024   0.878
   ETHNIC    PRESCHL               35.211       3      11.737    1.043   0.374
   ETHNIC    NEWSITE              158.368      11      14.397    1.280   0.235
   ETHNIC    NEWGROUP              31.390       4       7.847    0.697   0.594
   PRESCHL   NEWSITE               11.731       3       3.910    0.348   0.791
   PRESCHL   NEWGROUP              27.397       1      27.397    2.435   0.120
   NEWSITE   NEWGROUP              51.146       3      17.049    1.515   0.211

EXPLAINED                        3249.885      45      72.220    6.419   0.000

RESIDUAL                         3431.740     305      11.252

TOTAL                            6681.625     350      19.090
```

Table C-2
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                V4003     WPPSI.E.S77
          BY    SEX       MIDASV11
                ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH V3003      WPPSI.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      8.68                                          ADJUSTED FOR
                                                                INDEPENDENTS
                                         UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY              N       DEV'N                  DEV'N

SEX
    1 MALE                      174      -0.05                  -0.09
    2 FEMALE                    177       0.05                   0.09

ETHNIC
    1 BLACK                     100      -0.08                  -0.03
    2 HISPANIC                   33       0.01                  -0.47
    3 INDIAN,NATV ALASKAN        16       0.38                   1.04
    4 ANGLO                     185      -0.20                  -0.02
    5 ASIAN                      17       2.26                   0.32

PRESCHL
    1 YES                        12       2.07                   2.48
    2 NO                        339      -0.07                  -0.09

NEWSITE
    8 IOWA                       88      -0.15                  -0.20
    9 MARYLAND                   65       1.62                   1.36
   14 UTAH                      105      -0.64                  -0.36
   15 WASHINGTON                 93      -0.28                  -0.35

NEWGROUP
    1 PDC                       173      -0.14                  -0.10
    2 COMPARISON                178       0.14                   0.09
```

Table C-3

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Verbal Fluency-English *(N = 870)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
                     V4004     VERBAL FLUENCY.E.S77
                  BY SEX       MIDASV11
                     ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                     PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                     NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                     NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
                WITH V3004     VERBAL FLUENCY.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                       SUM OF                   MEAN             SIGNIF
SOURCE OF VARIATION                   SQUARES     DF           SQUARE       F     OF F

COVARIATES                           6872.625      1         6872.625 315.171    0.000
   V3004                             6872.625      1         6872.625 315.171    0.000

MAIN EFFECTS                         2638.301     18          146.572   6.722    0.000
   SEX                                 39.418      1           39.418   1.808    0.179
   ETHNIC                             447.895      4          111.974   5.135    0.000
   PRESCHL                            190.945      1          190.945   8.757    0.003
   NEWSITE                           1951.148     11          177.377   8.134    0.000
   NEWGROUP                             8.895      1            8.895   0.408    0.523

2-WAY INTERACTIONS                   1705.652     72           23.690   1.086    0.298
   SEX        ETHNIC                  306.552      4           76.638   3.515    0.007
   SEX        PRESCHL                  40.069      1           40.069   1.838    0.176
   SEX        NEWSITE                 124.229     11           11.294   0.518    0.892
   SEX        NEWGROUP                  0.610      1            0.610   0.028    0.867
   ETHNIC     PRESCHL                 219.694      4           54.924   2.519    0.040
   ETHNIC     NEWSITE                 722.449     26           27.786   1.274    0.164
   ETHNIC     NEWGROUP                 98.072      4           24.518   1.124    0.344
   PRESCHL    NEWSITE                 390.841     10           39.084   1.792    0.058
   PRESCHL    NEWGROUP                 83.958      1           83.958   3.850    0.050
   NEWSITE    NEWGROUP                174.450     10           17.445   0.800    0.629

EXPLAINED                           11216.578     91          123.259   5.653    0.000

RESIDUAL                            16965.074    778           21.806

TOTAL                               28181.652    869           32.430
```

Table C-3
(continued)

```
*** M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S ***
             V4004     VERBAL FLUENCY.E.S77
         BY  SEX       MIDASV11
             ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH  V3004     VERBAL FLUENCY.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     9.22                                          ADJUSTED FOR
                                             ADJUSTED FOR      INDEPENDENTS
                                 UNADJUSTED  INDEPENDENTS      + COVARIATES
VARIABLE + CATEGORY          N   DEV'N       DEV'N   BETA      DEV'N

SEX
   1 MALE                  429   -0.28                         -0.21
   2 FEMALE                441    0.27                          0.20

ETHNIC
   1 BLACK                 353   -0.80                          0.11
   2 HISPANIC              156   -0.30                         -0.28
   3 INDIAN,NATV ALASKAN    17    0.19                         -0.86
   4 ANGLO                 327    0.98                          0.11
   5 ASIAN                  17    0.37                         -0.97

PRESCHL
   1 YES                   128   -1.64                          0.37
   2 NO                    742    0.28                         -0.06

NEWSITE
   2 CALIFORNIA-ENGLISH     49   -2.81                         -1.54
   4 COLORADO               64    0.86                          0.74
   5 CONNECTICUT            91   -0.32                         -1.29
   6 GEORGIA                40   -2.09                         -1.61
   7 FLORIDA                68   -4.32                         -4.69
   8 IOWA                   68    0.09                          0.51
   9 MARYLAND               65    2.41                          2.59
  10 MICHIGAN              104   -0.88                         -0.16
  12 TEXAS-ENGLISH          41    1.80                          0.33
  14 UTAH                  105    1.27                          1.21
  15 WASHINGTON             96    0.71                          0.79
  16 WEST VIRGINIA          59    2.41                          1.99

NEWGROUP
   1 PDC                   464   -0.29                         -0.10
   2 COMPARISON            406    0.34                          0.11
```

Table C-4

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Verbal Memory-I-English *(N = 882)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
            V4005     VERBAL MEMORY-1.E.S77
         BY SEX       MIDASV11
            ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3005     VERBAL MEMORY-1.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

SOURCE OF VARIATION		SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES		9496.676	1	9496.676	358.769	0.000
V3005		9496.676	1	9496.676	358.769	0.000
MAIN EFFECTS		4068.449	18	226.025	8.539	0.000
SEX		116.836	1	116.836	4.414	0.036
ETHNIC		367.508	4	91.877	3.471	0.008
PRESCHL		430.105	1	430.105	16.249	0.000
NEWSITE		3109.543	11	282.686	10.679	0.000
NEWGROUP		44.457	1	44.457	1.680	0.195
2-WAY INTERACTIONS		1904.309	71	26.821	1.013	0.451
SEX	ETHNIC	6.471	4	1.618	0.061	0.993
SEX	PRESCHL	0.110	1	0.110	0.004	0.948
SEX	NEWSITE	261.684	11	23.789	0.899	0.541
SEX	NEWGROUP	7.118	1	7.118	0.269	0.604
ETHNIC	PRESCHL	417.269	4	104.317	3.941	0.004
ETHNIC	NEWSITE	501.805	25	20.072	0.758	0.797
ETHNIC	NEWGROUP	95.398	4	23.849	0.901	0.463
PRESCHL	NEWSITE	338.268	10	33.827	1.278	0.239
PRESCHL	NEWGROUP	109.769	1	109.769	4.147	0.042
NEWSITE	NEWGROUP	188.160	10	18.816	0.711	0.715
EXPLAINED		15469.434	90	171.883	6.493	0.000
RESIDUAL		20937.922	791	26.470		
TOTAL		36407.355	881	41.325		

Table C-4
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
             V4005     VERBAL MEMORY-1.E.S77
         BY  SEX       MIDASV11
             ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3005     VERBAL MEMORY-1.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     15.01                                          ADJUSTED FOR
                                                                INDEPENDENTS
                                           UNADJUSTED           + COVARIATES
VARIABLE + CATEGORY                 N      DEV'N                DEV'N

SEX
     1 MALE                        435     -0.64                -0.31
     2 FEMALE                      447      0.63                 0.30

ETHNIC
     1 BLACK                       354     -0.50                 0.33
     2 HISPANIC                    162      0.48                -0.71
     3 INDIAN,NATV ALASKAN          17     -1.19                -0.98
     4 ANGLO                       332      0.48                 0.22
     5 ASIAN                        17     -2.48                -3.54

PRESCHL
     1 YES                         127     -1.80                 0.27
     2 NO                          755      0.30                -0.04

NEWSITE
     2 CALIFORNIA-ENGLISH           52     -0.24                 0.71
     4 COLORADO                     70      1.27                 1.46
     5 CONNECTICUT                  91      0.33                -0.36
     6 GEORGIA                      40     -2.24                -1.94
     7 FLORIDA                      70     -5.50                -6.70
     8 IOWA                         88      1.09                 0.35
     9 MARYLAND                     65      1.91                 2.84
    10 MICHIGAN                    103     -0.57                 0.16
    12 TEXAS-ENGLISH                41      2.79                 1.99
    14 UTAH                        105      0.78                 0.48
    15 WASHINGTON                   97      0.56                 1.09
    16 WEST VIRGINIA                60     -0.75                -0.50

NEWGROUP
     1 PDC                         470     -0.61                -0.22
     2 COMPARISON                  412      0.70                 0.25
```

Table C-5

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Verbal Memory-3-English *(N = 869)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
              V4006      VERBAL MEMORY-3.E.S77
           BY SEX        MIDASV11
              ETHNIC     MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V3006      VERBAL MEMORY-3.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                     SUM OF                 MEAN              SIGNIF
SOURCE OF VARIATION                 SQUARES      DF        SQUARE        F      OF F

COVARIATES                         1488.966       1      1488.966  258.456     0.000
   V3006                           1488.966       1      1488.966  258.456     0.000

MAIN EFFECTS                        271.425      18        15.079    2.617     0.000
   SEX                                0.156       1         0.156    0.027     0.870
   ETHNIC                             2.831       4         0.708    0.123     0.974
   PRESCHL                            6.924       1         6.924    1.202     0.273
   NEWSITE                          212.293      11        19.299    3.350     0.000
   NEWGROUP                          49.222       1        49.222    8.544     0.004

2-WAY INTERACTIONS                  399.689      71         5.629    0.977     0.533
   SEX        ETHNIC                 12.490       4         3.122    0.542     0.705
   SEX        PRESCHL                 8.341       1         8.341    1.448     0.229
   SEX        NEWSITE                61.906      11         5.628    0.977     0.466
   SEX        NEWGROUP                5.052       1         5.052    0.877     0.349
   ETHNIC     PRESCHL                21.371       4         5.343    0.927     0.447
   ETHNIC     NEWSITE               106.108      25         4.244    0.737     0.822
   ETHNIC     NEWGROUP               49.723       4        12.431    2.158     0.072
   PRESCHL    NEWSITE                65.971      10         6.597    1.145     0.325
   PRESCHL    NEWGROUP               18.167       1        18.167    3.154     0.076
   NEWSITE    NEWGROUP               40.312      10         4.031    0.700     0.725

EXPLAINED                          2160.082      90        24.001    4.166     0.000

RESIDUAL                           4482.066     778         5.761

TOTAL                              6642.148     868         7.652
```

Table C-5
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                V4006     VERBAL MEMORY-3.E.S77
           BY   SEX       MIDASV11
                ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3006     VERBAL MEMORY-3.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      3.92                                            ADJUSTED FOR
                                                                  INDEPENDENTS
                                           UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY                   N    DEV'N                  DEV'N

SEX
   1 MALE                           429    -0.10                   0.00
   2 FEMALE                         440     0.10                  -0.00

ETHNIC
   1 BLACK                          350    -0.12                   0.20
   2 HISPANIC                       160    -0.15                  -0.09
   3 INDIAN,NATV ALASKAN             17    -0.50                  -0.13
   4 ANGLO                          326     0.25                  -0.13
   5 ASIAN                           16    -0.42                  -0.71

PRESCHL
   1 YES                            123    -0.31                   0.04
   2 NO                             746     0.05                  -0.01

NEWSITE
   2 CALIFORNIA-ENGLISH              50    -1.12                  -0.63
   4 COLORADO                        70     0.06                  -0.02
   5 CONNECTICUT                     89    -0.40                  -0.49
   6 GEORGIA                         40     0.46                   0.72
   7 FLORIDA                         68    -1.17                  -1.01
   8 IOWA                            86     0.13                  -0.11
   9 MARYLAND                        65     0.65                   0.60
  10 MICHIGAN                       102    -0.35                  -0.26
  12 TEXAS-ENGLISH                   38     2.29                   1.56
  14 UTAH                           105     0.10                   0.21
  15 WASHINGTON                      96     0.25                   0.18
  16 WEST VIRGINIA                   60     0.13                   0.24

NEWGROUP
   1 PDC                            464    -0.23                  -0.23
   2 COMPARISON                     405     0.26                   0.26
```

Table C-6

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Arm Coordination *(N = 868)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                 V4007     ARM COORDINATION.E.S77
              BY SEX       MIDASV11
                 ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                 PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                 NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                 NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
            WITH V3007     ARM COORDINATION.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                        SUM OF                     MEAN              SIGNIF
SOURCE OF VARIATION                    SQUARES      DF           SQUARE        F      OF F

COVARIATES                            1838.749       1         1838.748  206.617     0.000
   V3007                              1838.748       1         1838.748  206.617     0.000

MAIN EFFECTS                           613.560      18           34.087    3.830     0.000
   SEX                                 167.230       1          167.230   18.791     0.000
   ETHNIC                              199.362       4           49.841    5.600     0.000
   PRESCHL                              14.919       1           14.919    1.676     0.196
   NEWSITE                             229.820      11           20.893    2.348     0.008
   NEWGROUP                              2.229       1            2.228    0.250     0.617

2-WAY INTERACTIONS                     744.398      72           10.339    1.162     0.177
   SEX       ETHNIC                     58.395       4           14.599    1.640     0.162
   SEX       PRESCHL                    98.447       1           98.447   11.062     0.001
   SEX       NEWSITE                    78.868      11            7.170    0.806     0.635
   SEX       NEWGROUP                    4.377       1            4.377    0.492     0.483
   ETHNIC    PRESCHL                    12.909       4            3.227    0.363     0.835
   ETHNIC    NEWSITE                   202.072      26            7.772    0.873     0.649
   ETHNIC    NEWGROUP                    6.305       4            1.576    0.177     0.950
   PRESCHL   NEWSITE                   178.533      10           17.853    2.006     0.030
   PRESCHL   NEWGROUP                    4.219       1            4.219    0.474     0.491
   NEWSITE   NEWGROUP                   61.766      10            6.177    0.694     0.731

EXPLAINED                             3196.707      91           35.129    3.947     0.000

RESIDUAL                              6905.871     776            8.899

TOTAL                                10102.578     867           11.652
```

C-6
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V4007      ARM COORDINATION.E.S77
      BY    SEX        MIDASV11
            ETHNIC     MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
      WITH  V3007      ARM COORDINATION.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      4.49
                                                                 ADJUSTED FOR
                                                                 INDEPENDENTS
                                             UNADJUSTED          + COVARIATES
VARIABLE + CATEGORY                  N       DEV'N               DEV'N   BETA

SEX
   1 MALE                          428        0.74
   2 FEMALE                        440       -0.72                 0.47
                                                                  -0.45

ETHNIC
   1 BLACK                         353        0.55
   2 HISPANIC                      155        0.62                 0.29
   3 INDIAN,NATV ALASKAN            17        0.28                 0.27
   4 ANGLO                         325       -0.84                 0.53
   5 ASIAN                          18       -1.17                -0.40
                                                                  -1.33

PRESCHL
   1 YES                           128        0.80
   2 NO                            740       -0.14                 0.43
                                                                  -0.07

NEWSITE
   2 CALIFORNIA-ENGLISH             48        0.47
   4 COLORADO                       63        0.66                 0.79
   5 CONNECTICUT                    91        0.08                 0.40
   6 GEORGIA                        40       -0.39                -0.15
   7 FLORIDA                        68        1.50                -0.38
   8 IOWA                           88       -0.07                -0.32
   9 MARYLAND                       65        0.37                 0.31
  10 MICHIGAN                      104       -0.35                 0.58
  12 TEXAS-ENGLISH                  41        1.60                -0.38
  14 UTAH                          105       -1.60                 1.14
  15 WASHINGTON                     96        0.19                -0.89
  16 WEST VIRGINIA                  59       -0.95                 0.40
                                                                  -0.49

NEWGROUP
   1 PDC                           464        0.01
   2 COMPARISON                    404       -0.01                 0.05
                                                                  -0.06
```

Table C-7

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Draw-A-Child-English *(N = 871)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
          V4008    DRAW-A-CHILD.E.S77
       BY SEX      MIDASV11
          ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
          PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
          NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
          NEWGROUP ANALYTIC SAPPLE-INELIGIBLE CASES REMOVED
     WITH V3008    DRAW-A-CHILD.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                         SUM OF                 MEAN             SIGNIF
SOURCE OF VARIATION                     SQUARES       DF       SQUARE        F     OF F

COVARIATES                             1741.502        1     1741.502  395.595    0.000
   V3008                               1741.502        1     1741.502  395.595    0.000

MAIN EFFECTS                            298.361       18       16.576    3.765    0.000
   SEX                                   48.443        1       48.443   11.004    0.001
   ETHNIC                                37.201        4        9.300    2.113    0.077
   PRESCHL                               51.787        1       51.787   11.764    0.001
   NEWSITE                              112.841       11       10.258    2.330    0.008
   NEWGROUP                              48.088        1       48.088   10.924    0.001

2-WAY INTERACTIONS                      436.050       72        6.056    1.376    0.025
   SEX        ETHNIC                      9.183        4        2.296    0.521    0.720
   SEX        PRESCHL                     0.403        1        0.403    0.092    0.762
   SEX        NEWSITE                    51.868       11        4.715    1.071    0.382
   SEX        NEWGROUP                    0.488        1        0.488    0.111    0.739
   ETHNIC     PRESCHL                    17.836        4        4.459    1.013    0.400
   ETHNIC     NEWSITE                   141.493       26        5.442    1.236    0.194
   ETHNIC     NEWGROUP                   17.206        4        4.302    0.977    0.419
   PRESCHL    NEWSITE                    49.608       10        4.961    1.127    0.339
   PRESCHL    NEWGROUP                    1.434        1        1.434    0.326    0.568
   NEWSITE    NEWGROUP                   48.312       10        4.831    1.097    0.361

EXPLAINED                              2475.912       91       27.208    6.180    0.000

RESIDUAL                               3429.342      779        4.402

TOTAL                                  5905.254      870        6.788
```

Table C-7
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V4008     DRAW-A-CHILD.E.S77
       BY   SEX       MIDASV11
            ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3008     DRAW-A-CHILD.E.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     5.71                                              ADJUSTED FOR
                                                                   INDEPENDENTS
                                          UNADJUSTED               + COVARIATES
VARIABLE + CATEGORY                 N     DEV'N                    DEV'N

SEX
   1 MALE                         430     -0.56                    -0.28
   2 FEMALE                       441      0.55                     0.28

ETHNIC
   1 BLACK                        353     -0.57                     0.06
   2 HISPANIC                     156      0.77                     0.10
   3 INDIAN,NATV ALASKAN           17     -0.41                    -0.32
   4 ANGLO                        327      0.21                    -0.10
   5 ASIAN                         18      1.07                     0.19

PRESCHL
   1 YES                          127     -1.00                    -0.48
   2 NO                           744      0.17                     0.08

NEWSITE
   2 CALIFORNIA-ENGLISH            49      0.07                    -0.15
   4 COLORADO                      64      1.46                     0.78
   5 CONNECTICUT                   91      0.08                     0.20
   6 GEORGIA                       40     -1.41                    -0.35
   7 FLORIDA                       68     -1.74                    -0.62
   8 IOWA                          88     -0.05                    -0.06
   9 MARYLAND                      65      0.80                     0.30
  10 MICHIGAN                     104     -0.99                    -0.59
  12 TEXAS-ENGLISH                 41      1.66                     0.90
  14 UTAH                         105      0.37                     0.11
  15 WASHINGTON                    97      0.11                    -0.08
  16 WEST VIRGINIA                 59      0.14                     0.02

NEWGROUP
   1 PDC                          465     -0.25                    -0.23
   2 COMPARISON                   406      0.29                     0.26
```

Table C-8

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: PIPS *(N = 871)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4007    PIPS.F.S77
             BY SEX      MIDASV11
                ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3009    PIPS.F.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                         SUM OF                  MEAN             SIGNIF
SOURCE OF VARIATION                      SQUARES      DF        SQUARE       F      OF F

COVARIATES                               380.501       1       380.501  150.376    0.000
   V3009                                 380.501       1       380.501  150.376    0.000

MAIN EFFECTS                             131.667      18         7.315    2.891    0.000
   SEX                                     3.730       1         3.730    1.474    0.225
   ETHNIC                                 25.298       4         6.325    2.497    0.041
   PRESCHL                                 4.195       1         4.195    1.658    0.198
   NEWSITE                                89.824      11         8.166    3.227    0.000
   NEWGROUP                                8.620       1         8.620    3.407    0.065

2-WAY INTERACTIONS                       212.667      72         2.954    1.167    0.170
   SEX        ETHNIC                      18.479       4         4.620    1.826    0.122
   SEX        PRESCHL                     16.273       1        16.273    6.431    0.011
   SEX        NEWSITE                     31.400      11         2.855    1.128    0.336
   SEX        NEWGROUP                     9.097       1         9.097    3.595    0.058
   ETHNIC     PRESCHL                     12.608       4         3.152    1.246    0.290
   ETHNIC     NEWSITE                     63.790      26         2.453    0.970    0.509
   ETHNIC     NEWGROUP                    29.137       4         7.284    2.879    0.022
   PRESCHL    NEWSITE                     15.355      10         1.535    0.607    0.809
   PRESCHL    NEWGROUP                     4.860       1         4.860    1.921    0.166
   NEWSITE    NEWGROUP                    26.538      10         2.654    1.049    0.400

EXPLAINED                                724.835      91         7.965    3.148    0.000

RESIDUAL                                1971.158     779         2.530

TOTAL                                   2695.993     870         3.099
```

Table C-8
(continued)

```
 * * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              V4002     PIPS.E.S77
        BY    SEX       MIDASV11
              ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH  V3009     PIPS.E.E76
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

 GRAND MEAN =      2.72
                                                                  ADJUSTED FOR
                                                                  INDEPENDENTS
                                              UNADJUSTED          + COVARIATES
 VARIABLE + CATEGORY                    N     DEV'N               DEV'N

 SEX
    1 MALE                             430    -0.10               -0.06
    2 FEMALE                           441     0.10                0.06

 ETHNIC
    1 BLACK                            353    -0.22               -0.02
    2 HISPANIC                         156    -0.14               -0.04
    3 INDIAN,NATV ALASKAN               17     0.45                0.15
    4 ANGLO                            327     0.29                0.05
    5 ASIAN                             18    -0.16               -0.31

 PRESCHL
    1 YES                              128    -0.48                0.10
    2 NO                               743     0.09               -0.02

 NEWSITE
    2 CALIFORNIA-ENGLISH                49    -0.31               -0.22
    4 COLORADO                          44    -0.27               -0.09
    5 CONNECTICUT                       91    -0.09               -0.15
    6 GEORGIA                           40    -0.17                0.20
    7 FLORIDA                           68    -1.35               -1.05
    8 IOWA                              99     0.09               -0.12
    9 MARYLAND                          65     0.36                0.32
   10 MICHIGAN                         104    -0.20               -0.19
   12 TEXAS-ENGLISH                     41     0.57                0.42
   14 UTAH                             105     0.47                0.37
   15 WASHINGTON                        37     0.36                0.33
   16 WEST VIRGINIA                     59     0.33                0.21

 NEWGROUP
    1 PDC                              465    -0.11               -0.10
    2 COMPARISON                       406     0.12                0.11
```

Table C-9

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: POCL-1: "Task Orientation" *(N = 828)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
             V4011      POCL-1.S.S77: "TASK ORIENTATION"
          BY SEX        MIDASV11
             ETHNIC     MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3011      POCL-1.E.F76: "TASK ORIENTIATION"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                          SUM OF                     MEAN              SIGNIF
SOURCE OF VARIATION                      SQUARES      DF           SQUARE        F      OF F

COVARIATES                             14581.168       1        14581.169  213.959    0.000
   V3011                               14581.168       1        14581.169  213.959    0.000

MAIN EFFECTS                            6414.379      18          356.354    5.229    0.000
   SEX                                   313.184       1          313.184    4.596    0.032
   ETHNIC                                272.129       4           68.032    0.998    0.408
   PRESCHL                                14.148       1           14.148    0.208    0.649
   NEWSITE                              5787.914      11          526.174    7.721    0.000
   NEWGROUP                               27.004       1           27.004    0.396    0.529

2-WAY INTERACTIONS                      6077.809      72           84.414    1.239    0.095
   SEX        ETHNIC                      82.502       4           20.626    0.303    0.876
   SEX        PRESCHL                     59.546       1           59.546    0.874    0.350
   SEX        NEWSITE                    828.697      11           75.336    1.105    0.354
   SEX        NEWGROUP                     0.444       1            0.444    0.007    0.936
   ETHNIC     PRESCHL                    120.193       4           30.048    0.441    0.779
   ETHNIC     NEWSITE                   1627.236      26           62.586    0.919    0.583
   ETHNIC     NEWGROUP                   262.528       4           65.632    0.963    0.427
   PRESCHL    NEWSITE                    742.928      10           74.283    1.090    0.367
   PRESCHL    NEWGROUP                   611.752       1          611.752    8.977    0.003
   NEWSITE    NEWGROUP                  1122.266      10          112.227    1.647    0.089

EXPLAINED                              27073.355      91          297.509    4.366    0.000

RESIDUAL                               50158.145     736           68.150

TOTAL                                  77231.500     827           93.388
```

Table C-9
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              V4011     PDCI-1.E.S77: "TASK ORIENTATION"
          BY  SEX       MIDASV11
              ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V3011     PDCI-1.E.F76: "TASK ORIENTIATION"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     34.29                                            ADJUSTED FOR
                                                                  INDEPENDENTS
                                              UNADJUSTED          + COVARIATES
VARIABLE + CATEGORY                   N       DEV'N               DEV'N

SEX
   1 MALE                            411      -1.09               -0.71
   2 FEMALE                          417       1.07                0.70

ETHNIC
   1 BLACK                           327      -0.66                0.49
   2 HISPANIC                        149       1.31               -0.48
   3 INDIAN,NATV ALASKAN              17      -2.06               -0.76
   4 ANGLO                           317       0.13               -0.23
   5 ASIAN                            18       0.65                0.09

PRESCHL
   1 YES                             122      -0.43               -0.60
   2 NO                              706       0.07                0.10

NEWSITE
   2 CALIFORNIA-ENGLISH               43      -1.41               -2.63
   4 COLORADO                         64       0.82                2.32
   5 CONNECTICUT                      89      -0.76               -1.87
   6 GEORGIA                          38      -3.76               -3.67
   7 FLORIDA                          61      -0.15                0.14
   8 IOWA                             94      -3.67               -2.83
   9 MARYLAND                         61       0.87                0.92
  10 MICHIGAN                         22       1.12                0.62
  12 TEXAS-ENGLISH                    35       9.48               10.09
  14 UTAH                            105       2.80                1.95
  15 WASHINGTON                       90      -1.42               -1.02
  16 WEST VIRGINIA                    59      -2.12               -1.51

NEWGROUP
   1 PDC                             436      -0.05                0.19
   2 COMPARISON                      392       0.06               -0.20
```

Table C-10

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: POCL-2: "Sociability" *(N = 828)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
             V4012     POCL-2.F.S77: "SOCIABILITY"
          BY SEX       MIDASV11
             ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3012     POCL-2.E.F76: "SOCIABILITY"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                       SUM OF                     MEAN              SIGNIF
SOURCE OF VARIATION                   SQUARES       DF           SQUARE         F     OF F

COVARIATES                           2238.030        1         2238.030   212.190    0.000
   V3012                             2238.030        1         2238.030   212.190    0.000

MAIN EFFECTS                          905.431       18           50.302     4.769    0.000
   SEX                                  0.059        1            0.059     0.005    0.940
   ETHNIC                              39.921        4            9.980     0.946    0.437
   PRESCHL                             16.549        1           16.549     1.569    0.211
   NEWSITE                            812.513       11           73.865     7.003    0.000
   NEWGROUP                            36.389        1           36.389     3.450    0.064

2-WAY INTERACTIONS                    977.691       72           13.579     1.287    0.061
   SEX        ETHNIC                   35.418        4            8.855     0.840    0.500
   SEX        PRESCHL                   2.591        1            2.591     0.246    0.620
   SEX        NEWSITE                 118.577       11           10.780     1.022    0.425
   SEX        NEWGROUP                  0.006        1            0.006     0.001    0.981
   ETHNIC     PRESCHL                   5.898        4            1.475     0.140    0.967
   ETHNIC     NEWSITE                 355.083       26           13.657     1.295    0.149
   ETHNIC     NEWGROUP                 20.333        4            5.083     0.482    0.749
   PRESCHL    NEWSITE                  96.889       10            9.689     0.919    0.515
   PRESCHL    NEWGROUP                 60.331        1           60.331     5.720    0.017
   NEWSITE    NEWGROUP                148.898       10           14.890     1.412    0.170

EXPLAINED                            4121.152       91           45.287     4.294    0.000

RESIDUAL                             7762.789      735           10.547

TOTAL                               11883.941      827           14.370
```

Table C-10
(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
                V4012     PDCL-2.F.S77: "SOCIABILITY"
          BY    SEX       MIDASV11
                ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH  V3012     PDCL-2.F.F76: "SOCIABILITY"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     13.33                                              ADJUSTED FOR
                                                                    INDEPENDENTS
                                           UNADJUSTED               + COVARIATES
VARIABLE + CATEGORY                N       DEV'N                    DEV'N

SEX
   1 MALE                         411      -0.21                     -0.02
   2 FEMALE                       417       0.21                      0.02


ETHNIC
   1 BLACK                        327      -0.16                      0.27
   2 HISPANIC                     149       0.29                     -1.00
   3 INDIAN,NATV ALASKAN           17      -1.04                     -0.37
   4 ANGLO                        317       0.13                      0.22
   5 ASIAN                         18      -0.89                     -0.15


PRESCHL
   1 YES                          122       0.33                      0.40
   2 NO                           706      -0.06                     -0.07


NEWSITE
   2 CALIFORNIA-ENGLISH            43      -0.07                      0.12
   4 COLORADO                      64       1.23                      2.35
   5 CONNECTICUT                   99      -0.05                     -0.60
   6 GEORGIA                       39      -2.01                     -2.11
   7 FLORIDA                       61      -0.00                     -0.22
   8 IOWA                          94      -0.62                     -0.51
   9 MARYLAND                      61       0.10                      0.27
  10 MICHIGAN                      99       0.42                     -0.16
  12 TEXAS-ENGLISH                 35       2.61                      3.29
  14 UTAH                         105       0.63                      0.53
  15 WASHINGTON                    30      -1.07                     -1.00
  16 WEST VIRGINIA                 59      -0.87                     -0.82


NEWGROUP
   1 PDC                          436       0.08                      0.21
   2 COMPARISON                   392      -0.09                     -0.23
```

Table C-11

Analysis of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-1: "Friendliness" *(N = 795)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
            V721     CRS-1.S77: "FRIENDLINESS"
         BY SEX      MIDASV11
            ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                      SUM OF                  MEAN             SIGNIF
SOURCE OF VARIATION                  SQUARES      DF        SQUARE        F      OF F

MAIN EFFECTS                         820.885      17        48.287    4.128     0.000
   SEX                               358.218       1       358.218   30.623     0.000
   ETHNIC                            114.541       4        28.635    2.448     0.045
   PRESCHL                            23.032       1        23.032    1.969     0.161
   NEWSITE                           308.903      10        30.890    2.641     0.004
   NEWGROUP                           16.192       1        16.192    1.384     0.240

2-WAY INTERACTIONS                  1265.817      66        19.179    1.640     0.002
   SEX       ETHNIC                   83.761       4        20.940    1.790     0.129
   SEX       PRESCHL                   5.378       1         5.378    0.460     0.498
   SEX       NEWSITE                  85.276      10         8.528    0.729     0.697
   SEX       NEWGROUP                 81.928       1        81.928    7.004     0.008
   ETHNIC    PRESCHL                  32.462       4         8.115    0.694     0.596
   ETHNIC    NEWSITE                 659.621      24        27.484    2.350     0.000
   ETHNIC    NEWGROUP                 27.243       4         6.811    0.582     0.676
   PRESCHL   NEWSITE                  97.757       9        10.862    0.929     0.499
   PRESCHL   NEWGROUP                  0.654       1         0.654    0.056     0.813
   NEWSITE   NEWGROUP                 87.523       8        10.940    0.935     0.486

EXPLAINED                           2086.703      83        25.141    2.149     0.000

RESIDUAL                            8317.149     711        11.698

TOTAL                              10403.852     794        13.103
```

Table C-11
(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
            V721      CRS-1.S77: "FRIENDLINESS"
       BY   SEX       MIDASV11
            ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     18.65
                                                         ADJUSTED FOR
                                             UNADJUSTED  INDEPENDENTS
VARIABLE + CATEGORY                  N       DEV'N       DEV'N

SEX
     1 MALE                         398      -0.67       -0.65
     2 FEMALE                       397       0.67        0.65

ETHNIC
     1 BLACK                        343      -0.22       -0.26
     2 HISPANIC                     122       0.13        0.47
     3 INDIAN,NATV ALASKAN           17       0.82        0.76
     4 ANGLO                        294       0.00       -0.03
     5 ASIAN                         19       2.35        1.50

PRESCHL
     1 YES                          119      -0.47       -0.53
     2 NO                           676       0.08        0.09

NEWSITE
     2 CALIFORNIA-ENGLISH            28       1.24        0.34
     4 COLORADO                      66      -1.03       -1.45
     5 CONNECTICUT                   86       0.00        0.32
     6 GEORGIA                       39      -0.91       -0.87
     7 FLORIDA                       69      -0.32        0.37
     8 IOWA                          90      -0.36       -0.29
     9 MARYLAND                      64       1.68        1.54
    10 MICHIGAN                     104      -0.15        0.05
    14 UTAH                         102      -0.17       -0.36
    15 WASHINGTON                    87       0.49        0.25
    16 WEST VIRGINIA                 60       0.10        0.09

NEWGROUP
     1 PDC                          411       0.08        0.14
     2 COMPARISON                   364      -0.09       -0.16
```

Table C-12

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-2: "Agressiveness" *(N = 794)*

```
* * * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * * *
             V722     CRS-2.S77:"AGGRESSIVENESS"
          BY SEX      MIDASV11
             ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                          SUM OF                 MEAN             SIGNIF
SOURCE OF VARIATION                      SQUARES      DF        SQUARE        F     OF F

MAIN EFFECTS                            2027.603      17       119.271    4.377    0.000
   SEX                                   531.569       1       531.569   19.506    0.000
   ETHNIC                                169.229       4        42.307    1.552    0.185
   PRESCHL                               248.873       1       248.873    9.132    0.003
   NEWSITE                              1074.643      10       107.464    3.943    0.000
   NEWGROUP                                3.290       1         3.290    0.121    0.728

2-WAY INTERACTIONS                      1384.434      66        20.976    0.770    0.909
   SEX       ETHNIC                       24.569       4         6.142    0.225    0.924
   SEX       PRESCHL                     181.677       1       181.677    6.667    0.010
   SEX       NEWSITE                     173.105      10        17.311    0.635    0.784
   SEX       NEWGROUP                     40.433       1        40.433    1.484    0.224
   ETHNIC    PRESCHL                      34.136       4         8.534    0.313    0.869
   ETHNIC    NEWSITE                     578.667      24        24.111    0.885    0.624
   ETHNIC    NEWGROUP                     59.954       4        14.989    0.550    0.699
   PRESCHL   NEWSITE                     153.363       9        17.040    0.625    0.776
   PRESCHL   NEWGROUP                      5.800       1         5.800    0.213    0.645
   NEWSITE   NEWGROUP                    287.286       8        35.911    1.318    0.231

EXPLAINED                               3412.039      83        41.109    1.508    0.004

RESIDUAL                               19348.836     710        27.252

TOTAL                                  22760.875     793        28.702
```

Table C-12
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                 V722      CBS-2.S77:"AGGRESSIVENESS"
            BY   SEX       MIDASV11
                 ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                 PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                 NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                 NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     23.27
                                                         ADJUSTED FOR
                                           UNADJUSTED    INDEPENDENTS
VARIABLE + CATEGORY                   N    DEV'N         DEV'N

SEX
     1 MALE                         394      0.82          0.79
     2 FEMALE                       400     -0.81         -0.77


ETHNIC
     1 BLACK                        339      0.44          0.19
     2 HISPANIC                     125      0.12         -0.40
     3 INDIAN,NATV ALASKAN           17     -0.80         -0.57
     4 ANGLO                        294     -0.37          0.13
     5 ASIAN                         19     -2.22         -2.22


PRESCHL
     1 YES                          120      1.48          2.20
     2 NO                           674     -0.26         -0.39


NEWSITE
     2 CALIFORNIA-ENGLISH            30     -1.31         -0.50
     4 COLORADO                      68      1.21          1.82
     5 CONNECTICUT                   79      0.08         -0.47
     6 GEORGIA                       39     -1.15         -1.25
     7 FLORIDA                       69     -0.07         -1.84
     8 IOWA                          89     -0.62         -0.47
     9 MARYLAND                      65      0.46          0.96
    10 MICHIGAN                     104      2.12          1.93
    14 UTAH                         104     -0.47         -0.09
    15 WASHINGTON                    88     -0.34          0.05
    16 WEST VIRGINIA                 59     -1.97         -1.94


NEWGROUP
     1 PDC                          437     -0.17         -0.06
     2 COMPARISON                   357      0.21          0.07
```

Table C-13

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-3: "Perseverance" *(N = 793)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V723      CRS-3.S77:"PERSEVERANCE"
             BY SEX       MIDASV11
                ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                   SUM OF                  MEAN              SIGNIF
SOURCE OF VARIATION               SQUARES      DF        SQUARE        F      OF F

MAIN EFFECTS                     2687.905      18       149.328    4.711     0.000
   SEX                            692.899       1       692.899   21.861     0.000
   ETHNIC                         907.290       4       226.822    7.156     0.000
   PRESCHL                         36.277       1        36.277    1.145     0.285
   NEWSITE                       1051.033      11        95.548    3.015     0.001
   NEWGROUP                         0.406       1         0.406    0.013     0.910

2-WAY INTERACTIONS               3316.439      68        48.771    1.539     0.005
   SEX       ETHNIC               148.689       4        37.172    1.173     0.321
   SEX       PRESCHL               64.333       1        64.333    2.030     0.155
   SEX       NEWSITE              255.795      11        23.254    0.734     0.707
   SEX       NEWGROUP              24.542       1        24.542    0.774     0.379
   ETHNIC    PRESCHL               96.371       4        24.093    0.760     0.551
   ETHNIC    NEWSITE             1321.737      24        55.072    1.738     0.016
   ETHNIC    NEWGROUP             193.440       4        48.360    1.526     0.193
   PRESCHL   NEWSITE              423.589      10        42.359    1.336     0.207
   PRESCHL   NEWGROUP              26.798       1        26.798    0.845     0.358
   NEWSITE   NEWGROUP             684.324       8        85.541    2.699     0.006

EXPLAINED                        6004.344      86        69.818    2.203     0.000

RESIDUAL                        22377.355     706        31.696

TOTAL                           28381.699     792        35.835
```

Table C-13
(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
                V723      CRS-3.S77:"PERSEVERANCE"
          BY    SEX       MIDASV11
                ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     29.26

                                                          ADJUSTED FOR
                                           UNADJUSTED     INDEPENDENTS
VARIABLE + CATEGORY                   N    DEV'N          DEV'N

SEX
     1 MALE                         397      -0.93          -0.87
     2 FEMALE                       396       0.94           0.87

ETHNIC
     1 BLACK                        334      -0.93          -0.82
     2 HISPANIC                     131       0.14           0.35
     3 INDIAN,NATV ALASKAN           17       0.21           0.49
     4 ANGLO                        293       0.62           0.47
     5 ASIAN                         18       5.85           4.54

PRESCHL
     1 YES                          117      -0.94          -0.33
     2 NO                           676       0.16           0.06

NEWSITE
     2 CALIFORNIA-ENGLISH            30       1.51           0.64
     3 CALIFORNIA-SPANISH             6       2.07           1.77
     4 COLORADO                      67      -1.50          -1.84
     5 CONNECTICUT                   83      -0.68           0.04
     6 GEORGIA                       39      -1.16          -0.78
     7 FLORIDA                       68      -1.25          -0.23
     8 IOWA                          90       0.97           0.96
     9 MARYLAND                      65       3.49           3.12
    10 MICHIGAN                     101      -1.31          -0.84
    14 UTAH                         101       0.33          -0.17
    15 WASHINGTON                    83       0.05          -0.46
    16 WEST VIRGINIA                 60       0.16          -0.23

NEWGROUP
     1 PDC                          442      -0.03           0.02
     2 COMPARISON                   351       0.04          -0.03
```

Table C-14

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-4: "Independence" *(N = 809)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * * *
                 V724     CRS-4.S77:"INDEPENDENCE"
              BY SEX      MIDASV11
                 ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
                 PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
                 NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
                 NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                        SUM OF                    MEAN              SIGNIF
SOURCE OF VARIATION                    SQUARES      DF           SQUARE        F       OF F

MAIN EFFECTS                           131.111      17            7.712     3.263    0.000
   SEX                                  14.736       1           14.736     6.235    0.013
   ETHNIC                               49.238       4           12.310     5.209    0.000
   PRESCHL                               0.016       1            0.016     0.007    0.935
   NEWSITE                              61.757      10            6.176     2.613    0.004
   NEWGROUP                              5.364       1            5.364     2.270    0.132

2-WAY INTERACTIONS                     255.590      66            3.873     1.639    0.002
   SEX         ETHNIC                   14.513       4            3.628     1.535    0.190
   SEX         PRESCHL                   0.417       1            0.417     0.177    0.674
   SEX         NEWSITE                  33.635      10            3.364     1.423    0.165
   SEX         NEWGROUP                  0.043       1            0.043     0.018    0.893
   ETHNIC      PRESCHL                   3.945       4            0.961     0.407    0.804
   ETHNIC      NEWSITE                 106.797      24            4.450     1.883    0.007
   ETHNIC      NEWGROUP                 17.996       4            4.499     1.904    0.108
   PRESCHL     NEWSITE                  10.482       9            1.165     0.493    0.880
   PRESCHL     NEWGROUP                  7.385       1            7.385     3.125    0.078
   NEWSITE     NEWGROUP                 62.624       8            7.828     3.312    0.001

EXPLAINED                              386.701      83            4.659     1.971    0.000

RESIDUAL                              1713.386     725            2.363

TOTAL                                 2100.087     808            2.599
```

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Table C-14

(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V724     CPS-4.S77:"INDEPENDENCE"
       BY   SEX      MIDASV11
            ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      5.73
                                                               ADJUSTED FOR
                                                 UNADJUSTED    INDEPENDENTS
VARIABLE + CATEGORY                      N       DEV'N         DEV'N

SEX
     1 MALE                            403        0.14          0.10
     2 FEMALE                          406       -0.13         -0.10


ETHNIC
     1 BLACK                           347        0.26          0.17
     2 HISPANIC                        127       -0.11         -0.14
     3 INDIAN,NATV ALASKAN              17        0.33          0.27
     4 ANGLO                           299       -0.29         -0.17
     5 ASIAN                            19        0.22          0.17


PRESCHL
     1 YES                             120        0.16          0.05
     2 NO                              689       -0.03         -0.01


NEWSITE
     2 CALIFORNIA-ENGLISH               30       -0.49         -0.38
     4 COLORADO                         68        0.21          0.33
     5 CONNECTICUT                      99        0.23          0.13
     6 GEORGIA                          39       -0.11         -0.26
     7 FLORIDA                          71        0.27          0.09
     8 IOWA                             90        0.33          0.36
     9 MARYLAND                         65       -0.14         -0.13
    10 MICHIGAN                        104        0.20          0.13
    14 UTAH                            104       -0.48         -0.34
    15 WASHINGTON                       88        0.25          0.22
    16 WEST VIRGINIA                    62       -0.76         -0.62


NEWGROUP
     1 PDC                             441        0.05          0.08
     2 COMPARISON                      368       -0.05         -0.09
```

Table C-15

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-5: "Self-Assured" *(N = 788)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
                V725     CRS-5.S77: "SELF-ASSURED"
             BY SEX      MIDASV11
                ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
                PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                SUM OF                   MEAN              SIGNIF
SOURCE OF VARIATION            SQUARES      DF         SQUARE        F      OF F

MAIN EFFECTS                  1697.427      17         99.849    2.924     0.000
   SEX                         394.430       1        394.430   11.549     0.001
   ETHNIC                      272.511       4         68.128    1.995     0.094
   PRESCHL                     195.927       1        195.927    5.737     0.017
   NEWSITE                     822.692      10         82.269    2.409     0.008
   NEWGROUP                     11.866       1         11.866    0.347     0.556

2-WAY INTERACTIONS            2963.308      66         44.899    1.315     0.054
   SEX       ETHNIC             44.674       4         11.169    0.327     0.860
   SEX       PRESCHL             9.567       1          9.567    0.280     0.597
   SEX       NEWSITE           102.575      10         10.258    0.300     0.981
   SEX       NEWGROUP            0.699       1          0.699    0.020     0.886
   ETHNIC    PRESCHL           111.854       4         27.963    0.819     0.513
   ETHNIC    NEWSITE          1468.745      24         61.198    1.792     0.012
   ETHNIC    NEWGROUP          145.520       4         36.380    1.065     0.373
   PRESCHL   NEWSITE           447.673       9         49.741    1.456     0.160
   PRESCHL   NEWGROUP            0.364       1          0.364    0.011     0.918
   NEWSITE   NEWGROUP          859.681       8        107.460    3.146     0.002

EXPLAINED                     4660.734      83         56.153    1.644     0.001

RESIDUAL                     24043.223     704         34.152

TOTAL                        28703.957     787         36.473
```

Table C-15

(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
             V725     CRS-5.377: "SELF-ASSURED"
        BY   SEX      MIDASV11
             ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
             PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     30.75
                                                        ADJUSTED FOR
                                          UNADJUSTED    INDEPENDENTS
VARIABLE + CATEGORY              N        DEV'N         DEV'N

SEX
     1 MALE                     395        -0.71         -0.67
     2 FEMALE                   393         0.71          0.67


ETHNIC
     1 BLACK                    336        -0.05         -0.54
     2 HISPANIC                 125        -0.78         -0.24
     3 INDIAN,NATV ALASKAN       17         0.01          0.16
     4 ANGLO                    291         0.18          0.55
     5 ASIAN                     19         3.30          2.59


PRESCHL
     1 YES                      117         1.15          0.50
     2 NO                       671        -0.20         -0.09


NEWSITE
     2 CALIFORNIA-ENGLISH        30         0.72          0.59
     4 COLORADO                  65        -2.20         -1.95
     5 CONNECTICUT               83         0.53          0.88
     6 GEORGIA                   39        -1.91         -1.60
     7 FLORIDA                   68         1.70          1.93
     8 IOWA                      90        -1.05         -1.08
     9 MARYLAND                  65         1.76          1.65
    10 MICHIGAN                 100         0.01          0.27
    14 UTAH                     104        -0.31         -0.61
    15 WASHINGTON                85         0.57          0.22
    16 WEST VIRGINIA             59        -0.01         -0.44


NEWGROUP
     1 PDC                      435        -0.23         -0.12
     2 COMPARISON               353         0.29          0.14
```

Table C-16

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Variance: CRS Subscales--English-Dominant Sample
Dependent Variable: CRS-6: "Resourceful" *(N = 791)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
              V726      CRS-6.S77: "RESOURCEFUL"
           BY SEX       MIDASV11
              ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                         SUM OF                   MEAN             SIGNIF
SOURCE OF VARIATION                     SQUARES      DF          SQUARE       F      OF F

MAIN EFFECTS                            140.295      17           8.253    1.306    0.181
   SEX                                   39.332       1          39.332    6.223    0.013
   ETHNIC                                34.741       4           8.685    1.374    0.241
   PRESCHL                                0.023       1           0.023    0.004    0.952
   NEWSITE                               51.977      10           5.198    0.822    0.607
   NEWGROUP                              14.223       1          14.223    2.250    0.134

2-WAY INTERACTIONS                      489.520      66           7.417    1.174    0.172
   SEX        ETHNIC                     15.610       4           3.902    0.617    0.650
   SEX        PRESCHL                     0.107       1           0.107    0.017    0.896
   SEX        NEWSITE                    15.801      10           1.580    0.250    0.991
   SEX        NEWGROUP                    2.952       1           2.852    0.451    0.502
   ETHNIC     PRESCHL                    21.535       4           5.384    0.852    0.493
   ETHNIC     NEWSITE                   196.596      24           8.191    1.296    0.156
   ETHNIC     NEWGROUP                   33.523       4           8.381    1.326    0.259
   PRESCHL    NEWSITE                    75.969       9           8.441    1.336    0.215
   PRESCHL    NEWGROUP                    0.336       1           0.336    0.053    0.818
   NEWSITE    NEWGROUP                   88.901       8          11.113    1.758    0.082

EXPLAINED                               629.816      83           7.588    1.201    0.118

RESIDUAL                               4468.414     707           6.320

TOTAL                                  5058.230     790           6.453
```

Table C-16

(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S  * * *
              V726     CRS-6.S77: "RESOURCEFUL"
         BY   SEX      MIDASV11
              ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL  MIDASV500: PRESCHCOL EXPERIENCE
              NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     12.46
                                                       ADJUSTED FOR
                                          UNADJUSTED   INDEPENDENTS
VARIABLE + CATEGORY              N        DEV'N        DEV'N

SEX
    1 MALE                      397       -0.22        -0.20
    2 FEMALE                    394        0.22         0.20


ETHNIC
    1 BLACK                     338       -0.13        -0.21
    2 HISPANIC                  122       -0.03        -0.02
    3 INDIAN,NATV ALASKAN        17       -0.17        -0.08
    4 ANGLO                     295        0.09         0.18
    5 ASIAN                      19        1.28         1.18


PRESCHL
    1 YES                       116       -0.05         0.02
    2 NO                        675        0.01        -0.00


NEWSITE
    2 CALIFORNIA-ENGLISH         30        0.44         0.45
    4 COLORADO                   66       -0.23        -0.20
    5 CONNECTICUT                84        0.03         0.15
    6 GEORGIA                    39       -0.44        -0.22
    7 FLORIDA                    69       -0.29        -0.09
    8 IOWA                       90        0.02        -0.03
    9 MARYLAND                   63        0.33         0.22
   10 MICHIGAN                  100        0.35         0.45
   14 UTAH                      104       -0.09        -0.22
   15 WASHINGTON                 85        0.09        -0.04
   16 WEST VIRGINIA              61       -0.31        -0.47


NEWGROUP
    1 PDC                       437       -0.13        -0.13
    2 COMPARISON                354        0.16         0.16
```

Table C-17

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Weight *(N = 867)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
              V312      WEIGHT.S77
           BY SEX       MIDASV11
              ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V310      WEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                       SUM OF                  MEAN             SIGNIF
SOURCE OF VARIATION                   SQUARES      DF         SQUARE       F      OF F

COVARIATES                          25520.180       1    25520.1803627.935     0.0
   V310                             25520.180       1    25520.1803627.935     0.0

MAIN EFFECTS                          225.699      18       12.539     1.783   0.023
   SEX                                  0.449       1        0.449     0.064   0.801
   ETHNIC                               5.543       4        1.386     0.197   0.940
   PRESCHL                              0.082       1        0.082     0.012   0.915
   NEWSITE                            192.207      11       17.473     2.484   0.005
   NEWGROUP                            27.418       1       27.418     3.898   0.049

2-WAY INTERACTIONS                    508.355      72        7.060     1.004   0.472
   SEX         ETHNIC                  12.613       4        3.153     0.448   0.774
   SEX         PRESCHL                  1.410       1        1.410     0.200   0.654
   SEX         NEWSITE                 80.873      11        7.353     1.045   0.404
   SEX         NEWGROUP                 2.036       1        2.036     0.289   0.591
   ETHNIC      PRESCHL                 12.952       4        3.238     0.460   0.765
   ETHNIC      NEWSITE                202.619      26        7.793     1.108   0.324
   ETHNIC      NEWGROUP                 1.261       4        0.315     0.045   0.996
   PRESCHL     NEWSITE                 64.684      10        6.468     0.920   0.514
   PRESCHL     NEWGROUP                17.031       1       17.031     2.421   0.120
   NEWSITE     NEWGROUP               102.775      10       10.278     1.461   0.149

EXPLAINED                           26254.234      91      288.508    41.014   0.0

RESIDUAL                             5451.625     775        7.034

TOTAL                               31705.859     866       36.612
```

Table C-17
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V312      WEIGHT.S77
      BY    SEX       MIDASV11
            ETHNIC    MIDASV12:ETHNIC CLASSIFICATION
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATICN, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
      WITH  V310      WEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                                                                ADJUSTED FOR
GRAND MEAN =     40.66                                          INDEPENDENTS
                                                                + COVARIATES
                                          UNADJUSTED            DEV'N
VARIABLE + CATEGORY                  N    DEV'N

SEX                                                               0.02
     1 MALE                        430     0.35                  -0.02
     2 FEMALE                      437    -0.34

ETHNIC                                                            0.16
     1 BLACK                       349     0.43                  -0.25
     2 HISPANIC                    155     0.06                   0.10
     3 INDIAN,NATV ALASKAN          17     1.87                  -0.08
     4 ANGLO                       328    -0.53                   0.31
     5 ASIAN                        18    -0.99

PRESCHL                                                          -0.11
     1 YES                         127    -0.01                   0.02
     2 NO                          740     0.00

NEWSITE                                                           0.27
     2 CALIFORNIA-ENGLISH           44    -0.94                   0.83
     4 COLORADO                     71    -0.71                  -0.30
     5 CONNECTICUT                  38     1.94                  -1.43
     6 GEORGIA                      39    -0.55                   0.24
     7 FLORIDA                      71    -0.52                   0.14
     8 IOWA                         99     0.67                  -0.63
     9 MARYLAND                     62    -0.11                   0.09
    10 MICHIGAN                    104    -1.31                   0.73
    12 TEXAS-ENGLISH                41     3.00                  -0.37
    14 UTAH                        105    -1.07                   0.10
    15 WASHINGTON                   95     2.37                   0.17
    16 WEST VIRGINIA                58    -1.69

NEWGROUP
                                                                 -0.17
      1 PDC                        466    -0.22                   0.20
      2 COMPARISON                 401     0.25
```

Table C-18

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--English-Dominant Sample
Dependent Variable: Height *(N = 862)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                 V313     HEIGHT.S77
              BY SEX      MIDASV11
                 ETHNIC   MIDASV12:ETHNIC CLASSIFICATION
                 PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
                 NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
                 NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
            WITH V311     HEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                        SUM OF                  MEAN           SIGNIF
SOURCE OF VARIATION                    SQUARES      DF         SQUARE       F    OF F

COVARIATES                            2153.295       1       2153.295 937.041   0.0
   V311                               2153.295       1       2153.295 937.041   0.0

MAIN EFFECTS                           111.340      18          6.186   2.692   0.000
   SEX                                   1.618       1          1.618   0.704   0.402
   ETHNIC                               17.668       4          4.417   1.922   0.105
   PRESCHL                               0.888       1          0.888   0.386   0.534
   NEWSITE                              91.164      11          8.288   3.607   0.000
   NEWGROUP                              0.002       1          0.002   0.001   0.974

2-WAY INTERACTIONS                     140.876      72          1.957   0.851   0.803
   SEX        ETHNIC                     2.430       4          0.608   0.264   0.901
   SEX        PRESCHL                    7.264       1          7.264   3.161   0.076
   SEX        NEWSITE                   22.321      11          2.029   0.883   0.557
   SEX        NEWGROUP                   2.405       1          2.405   1.047   0.307
   ETHNIC     PRESCHL                    0.583       4          0.146   0.063   0.993
   ETHNIC     NEWSITE                   47.147      26          1.813   0.789   0.764
   ETHNIC     NEWGROUP                   1.555       4          0.389   0.169   0.954
   PRESCHL    NEWSITE                   10.485      10          1.048   0.456   0.918
   PRESCHL    NEWGROUP                   0.837       1          0.837   0.364   0.546
   NEWSITE    NEWGROUP                  27.676      10          2.768   1.204   0.284

EXPLAINED                             2405.510      91         26.434  11.503   0.0

RESIDUAL                              1769.439     770          2.298

TOTAL                                 4174.949     861          4.849
```

Table C-18
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              V313        HEIGHT.S77
        BY    SEX         MIDASV11
              ETHNIC      MIDASV12:ETHNIC CLASSIFICATION
              PRESCHL     MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE     SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP    ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH  V311        HEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                                                                 ADJUSTED FOR
GRAND MEAN =     42.02                                           INDEPENDENTS
                                              UNADJUSTED         + COVARIATES
                                                                 DEV'N
VARIABLE + CATEGORY                  N        DEV'N

SEX                                                                 -0.04
     1 MALE                        425         0.03                  0.03
     2 FEMALE                      437        -0.03

ETHNIC                                                               0.07
     1 BLACK                       346         0.38                 -0.02
     2 HISPANIC                    154        -0.34                 -0.01
     3 INDIAN,NATV ALASKAN          17         0.14                 -0.04
     4 ANGLO                       327        -0.19                 -0.37
     5 ASIAN                        18        -0.97


PRESCHL                                                              0.05
     1 YES                         127         0.26                 -0.01
     2 NO                          735        -0.05


NEWSITE                                                              0.31
     2 CALIFORNIA-ENGLISH           44        -0.32                 -0.40
     4 COLORADO                     70        -0.74                  0.13
     5 CONNECTICUT                  87         0.40                  0.03
     6 GEORGIA                      39         0.24                 -0.10
     7 FLORIDA                      71         0.24                  0.10
     8 IOWA                         89         0.02                 -0.70
     9 MARYLAND                     61        -0.71                  0.26
    10 MICHIGAN                    102         0.22                 -0.46
    12 TEXAS-ENGLISH                41         0.17                 -0.19
    14 UTAH                        104        -0.65                  0.13
    15 WASHINGTON                   96         0.63                  0.72
    16 WEST VIRGINIA                58         0.42

NEWGROUP
                                                                    -0.00
     1 PDC                         464         0.01                  0.00
     2 COMPARISON                  398        -0.01
```

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Table C-19

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: BSM-English *(N = 13)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4501     BSM-ENGLISH.S.S77
             BY SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3501     BSM-ENGLISH.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                     SUM OF               MEAN             SIGNIF
SOURCE OF VARIATION                 SQUARES     DF       SQUARE        F     OF F

COVARIATES                          261.826      1      261.826   63.948    0.000
   V3501                            261.826      1      261.826   63.948    0.000

MAIN EFFECTS                         39.102      4        9.775    2.388    0.163
   SEX                                6.329      1        6.329    1.546    0.260
   PRESCHL                           12.570      1       12.570    3.070    0.130
   NEWSITE                            0.743      1        0.743    0.182    0.685
   NEWGROUP                          19.460      1       19.460    4.753    0.072

2-WAY INTERACTIONS                    1.429      1        1.429    0.349    0.576
   SEX      NEWGROUP                  1.429      1        1.429    0.349    0.576

EXPLAINED                           302.356      6       50.393   12.308    0.004

RESIDUAL                             24.566      6        4.094

TOTAL                               326.923     12       27.244
```

Table C-19
(continued)

```
*** M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S ***
               V4501     BSM-ENGLISH.S.S77
       BY      SEX       MIDASV11
               PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
               NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
               NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH V3501     BSM-ENGLISH.S.F76
**************************************************************

GRAND MEAN =     6.08                                     ADJUSTED FOR
                                                          INDEPENDENTS
                                         UNADJUSTED       + COVARIATES
VARIABLE + CATEGORY              N       DEV'N            DEV'N

SEX
   1 MALE                        6       -1.24              0.67
   2 FEMALE                      7        1.07             -0.57

PRESCHL
   1 YES                         3        3.26             -0.07
   2 NO                         10       -0.98              0.02

NEWSITE
   3 CALIFORNIA-SPANISH          2       -0.08              6.22
  13 TEXAS-SPANISH              11        0.01             -1.13

NEWGROUP
   1 PDC                         7       -1.08              1.74
   2 COMPARISON                  6        1.26             -2.03
```

Table C-20

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: BSM-Spanish *(N = 75)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4502      BSM-SPANISH.S.S77
             BY SEX        MIDASV11
                PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3502      BSM-SPANISH.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                    SUM OF                       MEAN             SIGNIF
SOURCE OF VARIATION                 SQUARES       DF            SQUARE        F     OF F

COVARIATES                          199.727        1           199.727   37.975    0.000
   V3502                            199.727        1           199.727   37.975    0.000

MAIN EFFECTS                         12.441        4             3.110    0.591    0.670
   SEX                                3.129        1             3.129    0.595    0.443
   PRESCHL                            6.781        1             6.781    1.289    0.260
   NEWSITE                            2.309        1             2.309    0.439    0.510
   NEWGROUP                           0.223        1             0.223    0.042    0.838

2-WAY INTERACTIONS                   23.231        6             3.872    0.736    0.622
   SEX         PRESCHL                1.017        1             1.017    0.193    0.662
   SEX         NEWSITE                0.416        1             0.416    0.079    0.780
   SEX         NEWGROUP               1.683        1             1.683    0.320    0.574
   PRESCHL     NEWSITE                9.449        1             9.449    1.797    0.185
   PRESCHL     NEWGROUP               6.907        1             6.907    1.313    0.256
   NEWSITE     NEWGROUP               1.513        1             1.513    0.288    0.594

EXPLAINED                           235.401       11            21.400    4.069    0.000

RESIDUAL                            331.340       63             5.259

TOTAL                               566.741       74             7.659
```

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Table C-20
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V4502     BSA-SPANISH.S.S77
        BY  SEX       MIDASV11
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
      WITH  V3502     BSA-SPANISH.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                                                                 ADJUSTED FOR
GRAND MEAN =     12.49                                           INDEPENDENTS
                                          UNADJUSTED             + COVARIATES
                                 N        DEV'N                  DEV'N
VARIABLE + CATEGORY

SEX
    1 MALE                       38        0.14                   0.11
    2 FEMALE                     37       -0.14                  -0.11


PRESCHL
    1 YES                        19       -1.02                  -0.45
    2 NO                         56        0.35                   0.15

NEWSITE
    3 CALIFORNIA-SPANISH         16       -0.68                  -0.34
   11 TEXAS-SPANISH              59        0.19                   0.09

NEWGROUP
    1 PDC                        32        0.60                   0.07
    2 COMPARISON                 43       -0.45                  -0.05
```

Table C-21

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Verbal Fluency *(N = 81)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4504     VERBAL FLUENCY.S.S77
             BY SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3504     VERBAL FLUENCY.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                        SUM OF                  MEAN            SIGNIF
SOURCE OF VARIATION                    SQUARES      DF         SQUARE       F     OF F

COVARIATES                             501.458       1        501.458  30.886    0.000
   V3504                               501.458       1        501.458  30.886    0.000

MAIN EFFECTS                           163.734       4         40.934   2.521    0.049
   SEX                                  14.555       1         14.555   0.896    0.347
   PRESCHL                               4.650       1          4.650   0.286    0.594
   NEWSITE                             137.295       1        137.295   8.456    0.005
   NEWGROUP                              7.234       1          7.234   0.446    0.507

2-WAY INTERACTIONS                      62.087       6         10.348   0.637    0.700
   SEX       PRESCHL                     0.332       1          0.332   0.020    0.887
   SEX       NEWSITE                     3.604       1          3.604   0.222    0.639
   SEX       NEWGROUP                    3.710       1          3.710   0.229    0.634
   PRESCHL   NEWSITE                    53.822       1         53.822   3.315    0.073
   PRESCHL   NEWGROUP                    3.776       1          3.776   0.233    0.631
   NEWSITE   NEWGROUP                    1.273       1          1.273   0.078    0.780

EXPLAINED                              727.280      11         66.116   4.072    0.000

RESIDUAL                              1120.269      69         16.236

TOTAL                                 1847.548      80         23.094
```

Table C-21
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
               V4504     VERBAL FLUENCY.S.S77
          BY   SEX       MIDASV11
               PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
               NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
               NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH V3504     VERBAL FLUENCY.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     8.07
                                                                 ADJUSTED FOR
                                                                 INDEPENDENTS
                                          UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY                  N    DEV'N                  DEV'N

SEX
    1 MALE                          42     0.43                   0.26
    2 FEMALE                        39    -0.46                  -0.28

PRESCHL
    1 YES                           20    -0.72                   0.32
    2 NO                            61     0.24                  -0.11

NEWSITE
    3 CALIFORNIA-SPANISH            17    -3.72                  -2.67
   13 TEXAS-SPANISH                 64     0.99                   0.71

NEWGROUP
    1 PDC                           37     0.30                   0.34
    2 COMPARISON                    44    -0.26                  -0.29
```

Table C-22

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Verbal Memory-1 *(N = 81)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
                V4505     VERBAL MEMORY-1.S.S77
             BY SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3505     VERBAL MEMORY-1.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                  SUM OF                  MEAN              SIGNIF
SOURCE OF VARIATION              SQUARES       DF        SQUARE       F      OF F

COVARIATES                      1459.527        1      1459.527  66.747     0.000
   V3505                        1459.527        1      1459.527  66.747     0.000

MAIN EFFECTS                      66.608        4        16.652   0.762     0.554
   SEX                            53.586        1        53.586   2.451     0.122
   PRESCHL                         6.966        1         6.966   0.319     0.574
   NEWSITE                         2.489        1         2.489   0.114     0.737
   NEWGROUP                        3.567        1         3.567   0.163     0.688

2-WAY INTERACTIONS                32.265        6         5.377   0.246     0.959
   SEX       PRESCHL               0.382        1         0.382   0.017     0.895
   SEX       NEWSITE               2.562        1         2.562   0.117     0.733
   SEX       NEWGROUP              0.464        1         0.464   0.021     0.885
   PRESCHL   NEWSITE               0.209        1         0.209   0.010     0.922
   PRESCHL   NEWGROUP             21.975        1        21.975   1.005     0.320
   NEWSITE   NEWGROUP              0.025        1         0.025   0.001     0.973

EXPLAINED                       1558.400       11       141.673   6.479     0.000

RESIDUAL                        1508.800       69        21.867

TOTAL                           3067.201       80        38.340
```

Table C-22
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              V4505     VERBAL MEMORY-1.S.S77
        BY    SEX       MIDASV11
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH  V3505     VERBAL MEMORY-1.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =     17.10                                            ADJUSTED FOR
                                                                  INDEPENDENTS
                                          UNADJUSTED              + COVARIATES
VARIABLE + CATEGORY               N       DEV'N                   DEV'N

SEX
    1 MALE                       42        1.09                    0.72
    2 FEMALE                     39       -1.18                   -0.78

PRESCHL
    1 YES                        20       -1.40                   -0.50
    2 NO                         61        0.46                    0.16

NEWSITE
    3 CALIFORNIA-SPANISH         17       -4.04                    0.42
   13 TEXAS-SPANISH              64        1.07                   -0.11

NEWGROUP
    1 PDC                        37        0.52                    0.24
    2 COMPARISON                 44       -0.44                   -0.20
```

Table C-23

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Verbal Memory-3 *(N = 80)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4506     VERBAL MEMORY-3.S.S77
             BY SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3506     VERBAL MEMORY-3.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                               SUM OF                 MEAN              SIGNIF
SOURCE OF VARIATION           SQUARES      DF        SQUARE       F       OF F

COVARIATES                     82.264       1        82.264   15.908    0.000
   V3506                       82.264       1        82.264   15.908    0.000

MAIN EFFECTS                   92.719       4        23.180    4.482    0.003
   SEX                         20.617       1        20.617    3.987    0.050
   PRESCHL                      0.003       1         0.003    0.001    0.980
   NEWSITE                     67.877       1        67.877   13.126    0.001
   NEWGROUP                     4.222       1         4.222    0.816    0.369

2-WAY INTERACTIONS             26.369       6         4.395    0.850    0.536
   SEX      PRESCHL             0.271       1         0.271    0.052    0.820
   SEX      NEWSITE             0.004       1         0.004    0.001    0.978
   SEX      NEWGROUP            9.008       1         9.008    1.742    0.191
   PRESCHL  NEWSITE             1.188       1         1.188    0.230    0.633
   PRESCHL  NEWGROUP           10.018       1        10.018    1.937    0.169
   NEWSITE  NEWGROUP            1.844       1         1.844    0.357    0.552

EXPLAINED                     201.352      11        18.305    3.540    0.001

RESIDUAL                      351.644      68         5.171

TOTAL                         552.995      79         7.000
```

Table C-23
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V4506     VERBAL MEMORY-3.S.S77
        BY  SEX       MIDASV11
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3506     VERBAL MEMORY-3.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      4.75
                                                                  ADJUSTED FOR
                                                                  INDEPENDENTS
                                           UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY                  N     DEV'N                  DEV'N

SEX
     1 MALE                         42      0.70                   0.44
     2 FEMALE                       38     -0.78                  -0.49

PRESCHL
     1 YES                          20     -0.45                   0.49
     2 NO                           60      0.15                  -0.16

NEWSITE
     3 CALIFORNIA-SPANISH           17     -2.16                  -1.86
    13 TEXAS-SPANISH                63      0.58                   0.50

NEWGROUP
     1 PDC                          36      0.42                   0.27
     2 COMPARISON                   44     -0.34                  -0.22
```

Table C-24

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Arm Coordination *(N = 79)*

```
* * * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
             V4507     ARM COORDINATION.S.S77
          BY SEX       MIDASV11
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3507     ARM COORDINATION.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                      SUM OF                     MEAN            SIGNIF
SOURCE OF VARIATION                  SQUARES      DF           SQUARE       F      OF F

COVARIATES                            66.303       1           66.303   5.044   0.028
   V3507                              66.303       1           66.303   5.044   0.028

MAIN EFFECTS                         109.074       4           27.268   2.074   0.094
   SEX                                52.209       1           52.209   3.972   0.050-
   PRESCHL                            25.456       1           25.456   1.936   0.169
   NEWSITE                            13.282       1           13.282   1.010   0.318
   NEWGROUP                           18.126       1           18.126   1.379   0.244

2-WAY INTERACTIONS                   106.890       6           17.815   1.355   0.246
   SEX         PRESCHL                 4.383       1            4.383   0.333   0.566
   SEX         NEWSITE                15.443       1           15.443   1.175   0.282
   SEX         NEWGROUP                3.371       1            3.371   0.256   0.614
   PRESCHL     NEWSITE                65.141       1           65.141   4.955   0.029
   PRESCHL     NEWGROUP                0.478       1            0.478   0.036   0.849
   NEWSITE     NEWGROUP               13.743       1           13.743   1.045   0.310

EXPLAINED                            282.266      11           25.661   1.952   0.068

RESIDUAL                             880.763      67           13.146

TOTAL                               1163.029      79           14.911
```

Table C-24

(continued)

```
* * *  M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V4507    ARM COORDINATION.S.S77
         BY SEX      MIDASV11
            PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3507    ARM COORDINATION.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      6.33                                          ADJUSTED FOR
                                                                INDEPENDENTS
                                         UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY              N       DEV'N                  DEV'N

SEX
   1 MALE                       42        0.96                   0.63
   2 FEMALE                     37       -1.09                  -0.71


PRESCHL
   1 YES                        20       -1.44                  -0.59
   2 NO                         59        0.49                   0.20


NEWSITE
   3 CALIFORNIA-SPANISH         17       -1.46                  -0.79
  13 TEXAS-SPANISH              62        0.40                   0.22


NEWGROUP
   1 PDC                        36        0.83                   0.55
   2 COMPARISON                 43       -0.70                  -0.46
```

Table C-25

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Draw-A-Child *(N = 81)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
                V4508    DRAW-A-CHILD.S.S77
           BY SEX        MIDASV11
              PRESCHL    MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE    SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP   ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V3508      DRAW-A-CHILD.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                     SUM OF                  MEAN              SIGNIF
SOURCE OF VARIATION                 SQUARES      DF         SQUARE       F      OF F

COVARIATES                           47.995       1         47.995  16.156     0.000
   V3508                             47.995       1         47.995  16.156     0.000

MAIN EFFECTS                         27.923       4          6.981   2.350     0.063
   SEX                                0.113       1          0.113   0.038     0.846
   PRESCHL                            0.028       1          0.028   0.009     0.923
   NEWSITE                           27.777       1         27.777   9.350     0.003
   NEWGROUP                           0.005       1          0.005   0.002     0.967

2-WAY INTERACTIONS                   28.655       6          4.776   1.608     0.158
   SEX       PRESCHL                  5.064       1          5.064   1.705     0.196
   SEX       NEWSITE                  7.675       1          7.675   2.584     0.113
   SEX       NEWGROUP                 1.819       1          1.819   0.612     0.437
   PRESCHL   NEWSITE                  3.683       1          3.683   1.240     0.269
   PRESCHL   NEWGROUP                17.303       1         17.303   5.824     0.018
   NEWSITE   NEWGROUP                 6.601       1          6.601   2.222     0.141

EXPLAINED                           104.572      11          9.507   3.200     0.001

RESIDUAL                            204.981      69          2.971

TOTAL                               309.553      80          3.869
```

Table C-25
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                V4508     DRAW-A-CHILD.S.S77
           BY   SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
           WITH V3508     DRAW-A-CHILD.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      6.41                                              ADJUSTED FOR
                                                                    INDEPENDENTS
                                            UNADJUSTED              + COVARIATES
VARIABLE + CATEGORY                  N      DEV'N                   DEV'N

SEX
    1 MALE                          42      -0.10                   -0.09
    2 FEMALE                        39       0.11                    0.09

PRESCHL
    1 YES                           20       0.04                    0.32
    2 NO                            61      -0.01                   -0.10

NEWSITE
    3 CALIFORNIA-SPANISH            17      -1.47                   -1.25
   13 TEXAS-SPANISH                 64       0.39                    0.33

NEWGROUP
    1 PDC                           37      -0.03                    0.01
    2 COMPARISON                    44       0.02                   -0.01
```

Table C-26

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: PIPS *(N = 81)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * * *
          V4503    PIPS.S.S77
       BY SEX      MIDASV11
          PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
          NEWSITE  SITE DESIGNATION. BY LANGUAGE GROUP
          NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
     WITH V3503    PIPS.S.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                        SUM OF                  MEAN              SIGNIF
SOURCE OF VARIATION                    SQUARES       DF        SQUARE       F      OF F

COVARIATES                               7.950        1         7.950    2.417    0.125
   V3509                                 7.950        1         7.950    2.417    0.125

MAIN EFFECTS                            45.810        4        11.452    3.482    0.012
   SEX                                   0.383        1         0.383    0.116    0.734
   PRESCHL                               0.725        1         0.725    0.220    0.640
   NEWSITE                              26.104        1        26.104    7.937    0.006
   NEWGROUP                             18.598        1        18.598    5.654    0.020

2-WAY INTERACTIONS                       7.833        6         1.305    0.397    0.879
   SEX       PRESCHL                     0.000        1         0.000    0.000    0.991
   SEX       NEWSITE                     0.006        1         0.006    0.002    0.967
   SEX       NEWGROUP                    2.891        1         2.891    0.879    0.352
   PRESCHL   NEWSITE                     0.841        1         0.841    0.256    0.615
   PRESCHL   NEWGROUP                    1.985        1         1.985    0.604    0.440
   NEWSITE   NEWGROUP                    1.774        1         1.774    0.539    0.465

EXPLAINED                               61.592       11         5.599    1.702    0.091

RESIDUAL                               226.949       69         3.289

TOTAL                                  288.541       80         3.607
```

Table C-26
(Continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
             V4509     PIPS.S.577
        BY   SEX       MIDASV11
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3509     PIPS.S.576
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      3.23                                          ADJUSTED FOR
                                                                INDEPENDENTS
                                          UNADJUSTED            + COVARIATES
VARIABLE + CATEGORY                 N     DEV'N                 DEV'N

SEX
    1 MALE                         42      0.07                  0.05
    2 FEMALE                       39     -0.09                 -0.05


PRESCHL
    1 YES                          20     -0.23                 -0.15
    2 NO                           61      0.08                  0.05


NEWSITE
    3 CALIFORNIA-SPANISH           17     -1.18                 -1.17
   13 TEXAS-SPANISH                64      0.31                  0.31


NEWGROUP
    1 PDC                          37     -0.42                 -0.58
    2 COMPARISON                   44      0.35                  0.46
```

Table C-27

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: POCL-I: "Task Orientation" *(N = 77)*

```
* * * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
             V4511     POCL-1.S.S77: "TASK ORIENTATION"
          BY SEX       MIDASV11
             PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
             NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
             NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
        WITH V3511     POCL-1.S.F76: "TASK ORIENTATION"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                             SUM OF                      MEAN                SIGNIF
SOURCE OF VARIATION                         SQUARES        DF           SQUARE         F       OF F

COVARIATES                                 1105.912         1         1105.912    13.669    0.000
   V3511                                   1105.912         1         1105.912    13.669    0.000

MAIN EFFECTS                                821.971         4          205.493     2.540    0.048
   SEX                                      127.291         1          127.291     1.573    0.214
   PRESCHL                                  270.420         1          270.420     3.342    0.072
   NEWSITE                                  168.624         1          168.624     2.084    0.154
   NEWGROUP                                 255.636         1          255.636     3.160    0.080

2-WAY INTERACTIONS                          160.815         6           26.802     0.331    0.918
   SEX        PRESCHL                         3.328         1            3.328     0.041    0.840
   SEX        NEWSITE                         2.831         1            2.831     0.035    0.852
   SEX        NEWGROUP                       33.813         1           33.813     0.419    0.520
   PRESCHL    NEWSITE                        11.977         1           11.977     0.149    0.702
   PRESCHL    NEWGROUP                        5.157         1            5.157     0.064    0.801
   NEWSITE    NEWGROUP                       82.608         1           82.608     1.021    0.316

EXPLAINED                                  2088.699        11          189.882     2.347    0.017

RESIDUAL                                   5259.949        65           80.907

TOTAL                                      7347.649        76           96.680
```

Table C-27
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
              V3511     POCL-1.5.S77: "TASK ORIENTATION"
         BY   SEX       MIDASV11
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V3511     POCL-1.5.F76: "TASK ORIENTATION"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =    37.29                                               ADJUSTED FOR
                                                                    INDEPENDENTS
                                          UNADJUSTED                + COVARIATES
VARIABLE + CATEGORY              N        DEV'N                     DEV'N

SEX
     1 MALE                     39         1.77                      0.69
     2 FEMALE                   38        -1.91                     -0.71


PRESCHL
     1 YES                      18        -4.45                     -1.77
     2 NO                       59         1.36                      0.54


NEWSITE
     3 CALIFORNIA-SPANISH       17        -3.23                     -2.88
    13 TEXAS-SPANISH            60         0.93                      0.81


NEWGROUP
     1 PDC                      35         2.40                      2.09
     2 COMPARISON               42        -2.00                     -1.73
```

Table C-28

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish Dominant Sample
Dependent Variable: POCL-2 "Sociability" *(N = 77)*

```
* * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
          V4512    POCL-2.S.S77: "SOCIABILITY"
       BY SEX      MIDASV11
          PRESCHL  MIDASV500: PRESCHOOL EXPERIENCE
          NEWSITE  SITE DESIGNATION, BY LANGUAGE GROUP
          NEWGROUP ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
     WITH V3512    POCL-2.S.F76: "SOCIABILITY"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                        SUM OF                   MEAN           SIGNIF
SOURCE OF VARIATION                    SQUARES      DF          SQUARE       F     OF F

COVARIATES                             188.956       1         188.956  13.795    0.000
   V3512                               188.956       1         188.956  13.795    0.000

MAIN EFFECTS                            32.390       4           8.098   0.591    0.670
   SEX                                   0.213       1           0.213   0.016    0.901
   PRESCHL                              10.278       1          10.278   0.750    0.390
   NEWSITE                              17.774       1          17.774   1.298    0.259
   NEWGROUP                              4.125       1           4.125   0.301    0.585

2-WAY INTERACTIONS                     145.849       6          24.308   1.775    0.119
   SEX        PRESCHL                    1.605       1           1.605   0.117    0.733
   SEX        NEWSITE                   64.294       1          64.294   4.694    0.034
   SEX        NEWGROUP                  17.492       1          17.492   1.277    0.263
   PRESCHL    NEWSITE                   36.787       1          36.787   2.686    0.106
   PRESCHL    NEWGROUP                  19.059       1          19.059   1.391    0.242
   NEWSITE    NEWGROUP                   0.650       1           0.650   0.047    0.829

EXPLAINED                              367.195      11          33.381   2.437    0.013

RESIDUAL                               890.330      65          13.697

TOTAL                                 1257.525      76          16.546
```

Table C-28
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
           VAR12     PDCL-2.S.S77: "SOCIABILITY"
       BY  SEX       MIDASV11
           PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
           NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
           NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V3512    PDCL-2.S.F76: "SOCIABILITY"
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =    13.35                                          ADJUSTED FOR
                                                               INDEPENDENTS
                                          UNADJUSTED           + COVARIATES
VARIABLE + CATEGORY                 N     DEV'N                DEV'N

SEX
    1 MALE                         39      0.03                -0.18
    2 FEMALE                       38     -0.03                 0.18


PRESCHL
    1 YES                          18     -0.24                -0.36
    2 NO                           59      0.07                 0.11


NEWSITE
    3 CALIFORNIA-SPANISH           17     -0.12                -0.98
   13 TEXAS-SPANISH                60      0.03                 0.28


NEWGROUP
    1 PDC                          35      0.16                 0.25
    2 COMPARISON                   42     -0.14                -0.22
```

Table C-29

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Weight *(N = 72)*

```
* * * * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * * * * * * *
              V312      WEIGHT.S77
           BY SEX       MIDASV11
              PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
              NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
              NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
         WITH V310      WEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


                                               SUM OF                  MEAN          SIGNIF
SOURCE OF VARIATION                           SQUARES      DF         SQUARE      F     OF F

COVARIATES                                   1373.559       1       1373.559 206.094   0.000
   V310                                      1373.559       1       1373.559 206.094   0.000

MAIN EFFECTS                                   30.470       4          7.618   1.143   0.345
   SEX                                         16.573       1         16.573   2.487   0.120
   PRESCHL                                      2.897       1          2.897   0.435   0.512
   NEWSITE                                      1.427       1          1.427   0.214   0.645
   NEWGROUP                                     9.573       1          9.573   1.436   0.235

2-WAY INTERACTIONS                             95.399       6         15.900   2.386   0.039
   SEX        PRESCHL                          64.237       1         64.237   9.639   0.003
   SEX        NEWSITE                           1.358       1          1.358   0.204   0.653
   SEX        NEWGROUP                          2.339       1          2.339   0.351   0.556
   PRESCHL    NEWSITE                           8.952       1          8.952   1.343   0.251
   PRESCHL    NEWGROUP                          7.254       1          7.254   1.088   0.301
   NEWSITE    NEWGROUP                          7.555       1          7.555   1.134   0.291

EXPLAINED                                    1499.428      11        136.312  20.453   0.000

RESIDUAL                                      399.884      60          6.665

TOTAL                                        1899.312      71         26.751
```

Table C-29
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
            V312      WEIGHT.S77
       BY   SEX       MIDASV11
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V310      WEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                                                 ADJUSTED FOR
GRAND MEAN =     40.60                                           INDEPENDENTS
                                                                 + COVARIATES
                                            UNADJUSTED           DEV'N
VARIABLE + CATEGORY                  N      DEV'N

SEX                                                               -0.49
    1 MALE                           36      0.15                  0.48
    2 FEMALE                         36     -0.15

PRESCHL                                                            0.59
    1 YES                            19     -1.02                 -0.21
    2 NO                             53      0.37

NEWSITE                                                           -0.22
    3 CALIFORNIA-SPANISH             17     -2.24                  0.07
   13 TEXAS-SPANISH                  55      0.69

NEWGROUP                                                           0.42
    1 PDC                            33     -0.02                 -0.36
    2 COMPARISON                     39      0.02
```

Table C-30

Analyses of Factors Affecting Spring 1977 Child Measures
Analyses of Covariance: Test Scores--Spanish-Dominant Sample
Dependent Variable: Height (*N* = 72)

```
* * * * * * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * *
            V313      HEIGHT.S77
         BY SEX       MIDASV11
            PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
            NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
            NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
       WITH V311      HEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                     SUM OF                 MEAN              SIGNIF
SOURCE OF VARIATION                 SQUARES      DF        SQUARE       F       OF F

COVARIATES                          138.233       1       138.233   51.921    0.000
   V311                             138.233       1       138.233   51.921    0.000

MAIN EFFECTS                          2.972       4         0.743    0.279    0.890
   SEX                                0.700       1         0.700    0.263    0.610
   PRESCHL                            1.559       1         1.559    0.586    0.447
   NEWSITE                            0.356       1         0.356    0.134    0.716
   NEWGROUP                           0.356       1         0.356    0.134    0.716

2-WAY INTERACTIONS                   14.668       6         2.445    0.918    0.498
   SEX        PRESCHL                 0.191       1         0.191    0.072    0.790
   SEX        NEWSITE                 0.029       1         0.029    0.011    0.917
   SEX        NEWGROUP                6.979       1         6.979    2.621    0.111
   PRESCHL    NEWSITE                 2.702       1         2.702    1.015    0.314
   PRESCHL    NEWGROUP                0.631       1         0.631    0.237    0.629
   NEWSITE    NEWGROUP                0.317       1         0.317    0.119    0.731

EXPLAINED                           155.873      11        14.170    5.322    0.000

RESIDUAL                            159.743      60         2.662

TOTAL                               315.616      71         4.445
```

Table C-30
(continued)

```
* * *   M U L T I P L E   C L A S S I F I C A T I O N   A N A L Y S I S   * * *
                V311      HEIGHT.S77
          BY    SEX       MIDASV11
                PRESCHL   MIDASV500: PRESCHOOL EXPERIENCE
                NEWSITE   SITE DESIGNATION, BY LANGUAGE GROUP
                NEWGROUP  ANALYTIC SAMPLE-INELIGIBLE CASES REMOVED
          WITH  V311      HEIGHT.F76
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

GRAND MEAN =      42.03                                             ADJUSTED FOR
                                                                    INDEPENDENTS
                                             UNADJUSTED             + COVARIATES
VARIABLE + CATEGORY                  N       DEV'N                  DEV'N

SEX
     1 MALE                         36        0.00                  -0.08
     2 FEMALE                       36       -0.00                   0.09


PRESCHL
     1 YES                          19       -0.64                   0.25
     2 NO                           53        0.23                  -0.09

NEWSITE
     1 CALIFORNIA-SPANISH           17       -0.65                  -0.14
    11 TEXAS-SPANISH                55        0.20                   0.04

NEWGROUP
     1 PDC                          33       -0.21                  -0.09
     2 COMPARISON                   39        0.18                   0.07
```

APPENDIX D

Instrument Response Distributions

Table D-1

Response Distribution for: Bilingual Syntax Measure-English (BSM-E)
(English-Dominant Analytic Sample)
N = 886

ITEM NUMBER	CORRECT RESPONSE	INCORRECT RESPONSE	NO RESPONSE
1 (N=886)	92.7%	6.2%	1.1%
5 (n=886)	53.4	43.3	3.3
6 (n=869)	69.0	29.7	1.4
7 (n=869)	42.8	56.5	0.7
8 (n=869)	81.6	18.2	0.2
9 (n=869)	61.4	36.8	1.8
11 (n=869)	60.9	37.4	1.7
13 (n=869)	1.0	96.2	2.8
14 (n=869)	50.2	47.5	2.3
15 (n=869)	51.0	47.5	1.5
16 (n=868)	45.4	53.8	0.8
17 (n=868)	43.8	53.6	2.6
18 (n=868)	81.4	17.6	1.0
19 (n=868)	81.8	15.3	2.8
20 (n=868)	83.1	16.5	0.5
22 (n=868)	64.8	34.7	0.6
23 (n=868)	1.6	95.3	3.2
24 (n=869)	65.0	34.9	0.1

Table D-2

Response Distribution for: Bilingual Syntax Measure-Spanish (BSM-S)
(English-Dominant Analytic Sample)
N = 20

ITEM NUMBER	CORRECT RESPONSE	INCORRECT RESPONSE	NO RESPONSE
1 (N= 20)	65.0%	35.0%	0.0%
2 (n= 20)	70.0	25.0	5.0
3 (n= 20)	40.0	55.0	5.0
4 (n= 20)	30.0	65.0	5.0
5 (n= 20)	45.0	55.0	0.0
6 (n= 18)	25.0	65.0	10.0
7 (n= 18)	55.0	45.0	0.0
8 (n= 18)	65.0	35.0	0.0
11 (n= 18)	60.0	35.0	5.0
13 (n= 18)	55.0	40.0	5.0
14 (n= 18)	45.0	55.0	0.0
16 (n= 18)	0.0	90.0	10.0
18 (n= 18)	50.0	45.0	5.0
20 (n= 18)	55.0	40.0	5.0
21 (n= 18)	20.0	80.0	0.0
22 (n= 18)	35.0	65.0	0.0
[illegible] (n= 18)	45.0	50.0	5.0
[illegible] (n= 18)	0.0	95.0	5.0

Table D-3

Response Distribution for: Block Design (WPPSI)
(English-Dominant Analytic Sample)
N = 352

	PERCENT OF CHILDREN SCORING:				
ITEM NUMBER	TWO POINTS	ONE POINT	NO POINTS	NO RESPONSE	NOT ADMINISTERED
Design 1 (n=352)	80.1	14.2	5.7	0.0	0.0
Design 2 (n=352)	89.5	8.0	2.6	0.0	0.0
Design 3 (n=347)	53.7	16.2	28.7	0.0	1.4
Design 4 (n=347)	38.9	17.0	42.3	0.3	1.4
Design 5 (n=284)	40.3	15.3	24.7	0.3	19.3
Design 6 (n=247)	14.5	15.3	40.1	0.3	29.8
Design 7 (n=206)	28.1	13.1	17.3	0.0	41.5
Design 8 (n=166)	23.9	12.5	10.5	0.3	52.9
Design 9 (n=160)	2.0	3.7	39.2	0.6	54.5
Design 10 (n=129)	1.1	9.1	25.9	0.6	63.4

Table D-4

Response Distribution for: Verbal Fluency
(English-Dominant Analytic Sample)
N = 887

	NO. OF EXAMPLES		
	MEAN	STANDARD DEVIATION	PERCENT NO RESPONSE
I. ANIMALS	2.3	1.9	10.8
II. THINGS TO EAT	2.8	1.8	6.8
III. NAMES	2.3	2.2	18.6
IV. TOYS	1.8	1.5	7.9

Table D-5

Response Distribution for: Verbal Memory (MSCA)
(English-Dominant Analytic Sample)
N = 888

SCALE 1. ITEM	NUMBER OF WORDS REPEATED 6	5	4	3	2	1	0	NO RESPONSE	NOT AD-MINISTERED
1.DOLL-DARK-COAT	0.%	0.%	0.%	56.%	24.%	8.%	1.%	11.%	0.%
2.AFTER-COLOR-FUNNY-TODAY	0.	0.	56.	24.	5.	4.	Q.	10.	0.
3.AROUND-BECAUSE-UNDER-NEVER	0.	0.	26.	33.	19.	8.	1.	15.	0.
4.BUTTON-LEMON-BEFORE-CARRY-NOTHING	0.	13.	18.	23.	16.	11.	1.	13.	6.
5.CANDY-FINGER-HOSPITAL-FOURTEEN-EMPTY	0.	2.	12.	27.	26.	14.	1.	13.	6.
6.BANANA-UNTIL-BELIEVE-OTHER-SHADOW-GRANDMOTHER	0.	7.	9.	23.	23.	18.	1.	13.	11.
7.QUESTION-PENCIL-SATURDAY-TABLE-HAPPY-CAMERA	0.	0.	8.	25.	24.	14.	1.	17.	11.

	MC CARTHY SCORE 6	5	4	3	2	1	0	CORRECT SEQUENCE
1.DOLL-DARK-COAT	0.%	0.%	0.%	52.%	27.%	9.%	1.%	83.%
2.AFTER-COLOR-FUNNY-TODAY	0.	0.	49.	29.	7.	5.	0.	80.
3.AROUND-BECAUSE-UNDER-NEVER	0.	0.	24.	30.	22.	9.	1.	77.
4.BUTTON-LEMON-BEFORE-CARRY-NOTHING	0.	12.	16.	22.	18.	13.	1.	69.
5.CANDY-FINGER-HOSPITAL-FOURTEEN-EMPTY	0.	1.	8.	23.	30.	18.	1.	65.
6.BANANA-UNTIL-BELIEVE-OTHER-SHADOW-GRANDMOTHER	0.	2.	7.	21.	25.	19.	1.	66.
7.QUESTION-PENCIL-SATURDAY-TABLE-HAPPY-CAMERA	0.	0.	4.	20.	28.	18.	1.	53.

SCALE 2. STORY PART(N= 882)	CREDIT FOR PARTS OF THE STORY ONE POINT	NO POINTS	NO RESPONSE	NOT AD-MINISTERED
1.TERM USED FOR BOB	67.3%	10.8%	16.7%	5.2%
2.TERM USED FOR WOMAN	59.9	18.3	16.7	5.2
3.TERM USED FOR LETTERS	67.9	10.2	16.7	5.2
4.BOB WALKING TO STORE	13.2	65.0	16.7	5.2
5.BOB SAW WOMAN	11.5	66.6	16.7	5.2
6.WIND BLEW LETTERS	42.1	36.1	16.7	5.2
7.BOB SHOUTED, "..."	13.2	65.0	16.7	5.2
8.BOB WAS CAREFUL	27.2	50.9	16.7	5.2
9.BOB PICKED UP LETTERS	52.5	25.6	16.7	5.2
10.WOMAN WAS HAPPY	22.8	55.3	16.7	5.2
11.WOMAN THANKED BOB	14.6	63.5	16.7	5.2

Table D-6

Response Distribution for: Arm Coordination
(English-Dominant Analytic Sample)
N = 887

		PERCENT RESPONSE	PERCENT NO RESPONSE
I. BALL BOUNCING			
SCORE			0.79
	7	0.23	
	6	0.56	
	5	1.35	
	4	3.49	
	3	26.49	
	2	34.84	
	1	31.68	
	0	0.0	
II. BEANBAG CATCH GAME			
A. TOTAL TIMES BAG CAUGHT			0.23
	3	6.09	
	2	15.11	
	1	25.70	
	0	52.76	
B. BAG CAUGHT PREFERRED HAND			0.0
	3	0.79	
	2	5.86	
	1	11.95	
	0	81.29	
C. BAG CAUGHT NON-PREFERRED HAND			0.0
	3	0.68	
	2	2.14	
	1	6.88	
	0	90.30	
III. BEANBAG GAME			
A. PREFERRED HAND			0.11
	6	0.11	
	5	1.24	
	4	4.96	
	3	10.26	
	2	18.26	
	1	31.79	
	0	33.15	
B. NON-PREFERRED HAND*			0.0
	6	0.0	
	5	0.11	
	4	[illegible]	
	3	[illegible]	
	2	12.18	
	1	22.32	
	0	26.38	

*III. B. IS ADMINISTERED ONLY TO CHILDREN RESPONDING TO III. A.

Table D-7

Response Distribution for: Draw-A-Child
(English-Dominant Analytic Sample)
N = 888

BODY PART	PERCENT OF CHILDREN HAVING BODY PART PRESENT IN DRAWING
HEAD	89.9
HAIR	51.6
EYES	85.8
NOSE	63.1
MOUTH	72.4
NECK	5.6
TRUNK	48.0
ARMS AND HANDS	51.8
ATTACHMENT OF ARMS	27.0
LEGS AND FEET	74.3
NO DRAWING	2.4

Table D-8

Response Distribution for: Pupil Observation Checklist (POCL)
(English-Dominant Analytic Sample)
N = 886

CHILD'S TESTING BEHAVIOR	PERCENT OF CHILDREN IN RATINGS CATEGORIES 7	6	5	4	3	2	1	PERCENT NOT RATED
COOPERATIVE	14.1	15.0	19.8	37.7	7.8	3.0	2.5	0.0
SOCIABLE	12.0	16.1	20.5	32.1	12.0	4.5	2.8	0.0
INVOLVED	8.0	13.9	17.7	46.7	7.8	3.2	2.1	0.0
TALKATIVE	11.3	13.7	18.5	30.9	15.6	5.9	4.0	0.0
ATTENTIVE	6.8	14.7	17.6	40.3	10.9	4.9	4.5	0.0
ACTIVE	7.4	12.6	14.9	49.3	9.0	4.4	1.9	0.0
RELAXED	6.4	11.5	12.2	41.3	11.3	7.1	6.4	0.0
QUICK TO RESPOND	8.2	13.9	15.5	50.6	7.4	2.1	1.7	0.0
ATTEMPTS DIFFICULT TASKS	6.7	12.9	16.3	32.5	15.8	9.6	6.1	0.0
KEEPS TRYING	5.5	11.9	13.7	40.9	14.2	7.0	6.1	0.0
SELF-CONFIDENT	6.3	12.4	14.3	40.5	13.1	6.1	6.5	0.0
HANDICAP AFFECTED PERFORMANCE	1.0	1.0	0.7	0.6	0.8	0.6	0.1	0.0

Table D-9

Response Distribution for: Bilingual Syntax Measure-English (BSM-E)
(Spanish-Dominant Analytic Sample)
N = 15

ITEM NUMBER	CORRECT RESPONSE	INCORRECT RESPONSE	NO RESPONSE
1 (N= 15)	80.0%	13.3%	6.7%
3 (n= 15)	53.3	26.7	20.0
6 (n= 12)	20.0	73.3	6.7
7 (n= 12)	13.3	80.0	6.7
8 (n= 12)	40.0	46.7	13.3
9 (n= 12)	60.0	40.0	0.0
11 (n= 12)	46.7	40.0	13.3
13 (n= 12)	0.0	73.3	26.7
14 (n= 12)	33.3	60.0	6.7
15 (n= 12)	40.0	53.3	6.7
16 (n= 12)	33.3	66.7	0.0
17 (n= 12)	40.0	53.3	6.7
18 (n= 12)	33.3	60.0	6.7
19 (n= 12)	46.7	33.3	20.0
20 (n= 12)	46.7	53.3	0.0
22 (n= 12)	20.0	80.0	0.0
23 (n= 12)	0.0	80.0	20.0
24 (n= 12)	26.7	73.3	0.0

Table D-10

Response Distribution for: Bilingual Syntax Measure-Spanish (BSM-S)
(Spanish-Dominant Analytic Sample)
N = 79

ITEM NUMBER	CORRECT RESPONSE	INCORRECT RESPONSE	NO RESPONSE
1 (N= 79)	93.7%	6.3%	0.0%
2 (n= 79)	97.5	2.5	0.0
3 (n= 79)	49.4	49.4	1.3
4 (n= 79)	58.2	41.8	0.0
5 (n= 79)	77.2	22.8	0.0
6 (n= 79)	39.2	57.0	3.8
7 (n= 79)	91.1	7.6	1.3
8 (n= 79)	94.9	5.1	0.0
11 (n= 79)	86.1	12.7	1.3
13 (n= 79)	93.7	5.1	1.3
14 (n= 79)	79.7	19.0	1.3
16 (n= 79)	6.3	93.7	0.0
18 (n= 79)	81.0	13.9	5.1
20 (n= 79)	81.0	17.7	1.3
21 (n= 79)	62.0	36.7	1.3
22 (n= 79)	79.7	17.7	2.5
23 (n= 79)	77.2	21.5	1.3
24 (n= 79)	10.1	82.3	7.6

Table D-11

Response Distribution for: Verbal Fluency
(Spanish-Dominant Analytic Sample)
N = 81

	NO. OF EXAMPLES MEAN	STANDARD DEVIATION	PERCENT NO RESPONSE
I. ANIMALS	2.0	1.5	7.4
II. THINGS TO EAT	2.3	1.5	7.4
III. NAMES	2.0	1.9	17.3
IV. TOYS	1.8	1.3	4.9

Table D-12

Response Distribution for: Verbal Memory (MSCA)
(Spanish-Dominant Analytic Sample)
N = 81

SCALE 1. ITEM	NUMBER OF WORDS REPEATED 6	5	4	3	2	1	0	NO RESPONSE	NOT ADMINISTERED
1.DOLL-DARK-COAT	0.%	0.%	0.%	77.%	9.%	6.%	0.%	9.%	0.%
2.AFTER-COLOR-FUNNY-TODAY	0.	0.	28.	41.	20.	6.	0.	5.	0.
3.AROUND-BECAUSE-UNDER-NEVER	0.	0.	48.	25.	11.	6.	0.	10.	0.
4.BUTTON-LEMON-BEFORE-CARRY-NOTHING	0.	23.	26.	16.	11.	16.	0.	2.	5.
5.CANDY-FINGER-HOSPITAL-FOURTEEN-EMPTY	0.	0.	9.	36.	35.	10.	0.	5.	5.
6.BANANA-UNTIL-BELIEVE-OTHER-SHADOW-GRANDMOTHER	0.	2.	10.	26.	36.	12.	0.	9.	5.
7.QUESTION-PENCIL-SATURDAY-TABLE-HAPPY-CAMERA	0.	1.	12.	30.	32.	12.	0.	7.	5.

	MC CARTHY SCORE 6	5	4	3	2	1	0	CORRECT SEQUENCE
1.DOLL-DARK-COAT	0.%	0.%	0.%	75.%	9.%	7.%	0.%	89.%
2.AFTER-COLOR-FUNNY-TODAY	0.	0.	25.	38.	25.	7.	0.	64.
3.AROUND-BECAUSE-UNDER-NEVER	0.	0.	44.	25.	14.	7.	0.	81.
4.BUTTON-LEMON-BEFORE-CARRY-NOTHING	0.	23.	20.	19.	14.	17.	0.	51.
5.CANDY-FINGER-HOSPITAL-FOURTEEN-EMPTY	0.	0.	6.	33.	33.	16.	0.	75.
6.BANANA-UNTIL-BELIEVE-OTHER-SHADOW-GRANDMOTHER	0.	2.	9.	25.	36.	15.	0.	86.
7.QUESTION-PENCIL-SATURDAY-TABLE-HAPPY-CAMERA	0.	6.	9.	21.	36.	22.	0.	56.

SCALE 3. STORY PART (N 81)	CREDIT FOR PARTS OF THE STORY ONE POINT	NO POINTS	NO RESPONSE	NOT ADMINISTERED
1.TERM USED FOR BOB	79.0%	7.4%	9.9%	3.7%
2.TERM USED FOR WOMAN	72.8	13.6	9.9	3.7
3.TERM USED FOR LETTERS	85.2	1.2	9.9	3.7
4.BOB WALKING TO STORE	24.7	61.7	9.9	3.7
5.BOB SAW WOMAN	16.0	70.4	9.9	3.7
6.WIND BLEW LETTERS	43.2	43.2	9.9	3.7
7.BOB SHOUTED, "..."	11.1	75.3	9.9	3.7
8.BOB WAS CAREFUL	34.6	51.9	9.9	3.7
9.BOB PICKED UP LETTERS	60.5	25.9	9.9	3.7
10.WOMAN WAS HAPPY	35.8	50.6	9.9	3.7
11.WOMAN THANKED BOB	13.6	72.8	9.9	3.7

Table D-13

Response Distribution for: Arm Coordination
(Spanish-Dominant Analytic Sample)
N = 81

	PERCENT RESPONSE	PERCENT NO RESPONSE
I. BALL BOUNCING		
SCORE		2.47
7	1.23	
6	2.47	
5	0.0	
4	2.47	
3	40.74	
2	35.80	
1	14.81	
0	0.0	
II. BEANBAG CATCH GAME		
A. TOTAL TIMES BAG CAUGHT		0.0
3	7.41	
2	23.46	
1	33.33	
0	35.80	
B. BAG CAUGHT PREFERRED HAND		0.0
3	0.0	
2	14.81	
1	20.99	
0	64.20	
C. BAG CAUGHT NON-PREFERRED HAND		0.0
3	0.0	
2	1.23	
1	16.05	
0	82.72	
III. BEANBAG GAME		
A. PREFERRED HAND		0.0
6	0.0	
5	1.23	
4	6.17	
3	16.05	
2	25.93	
1	35.80	
0	14.81	
B. NON-PREFERRED HAND*		0.0
6	0.0	
5	1.23	
4	4.94	
3	11.11	
2	18.52	
1	25.93	
0	23.46	

*III.-B. IS ADMINISTERED ONLY TO CHILDREN RESPONDING TO III.-A.

Table D-14

Response Distribution for: Draw-A-Child
(Spanish-Dominant Analytic Sample)
N = 81

BODY PART	PERCENT OF CHILDREN HAVING BODY PART PRESENT IN DRAWING
HEAD	96.3
HAIR	49.4
EYES	96.3
NOSE	81.5
MOUTH	85.2
NECK	2.5
TRUNK	50.6
ARMS AND HANDS	61.7
ATTACHMENT OF ARMS	32.1
LEGS AND FEET	85.2
NO DRAWING	0.0

Table D-15

Response Distribution for: Pupil Observation Checklist (POCL)
(Spanish-Dominant Analytic Sample)
N = 79

	PERCENT OF CHILDREN IN RATINGS CATEGORIES							PERCENT NOT RATED
	7	6	5	4	3	2	1	
CHILD'S TESTING BEHAVIOR								
COOPERATIVE	16.5	27.8	24.1	22.8	5.1	3.8	0.0	0.0
SOCIABLE	3.8	27.8	19.0	30.4	10.1	5.1	3.8	0.0
INVOLVED	3.8	29.1	21.5	31.6	8.9	5.1	0.0	0.0
TALKATIVE	10.1	16.5	16.5	31.6	12.7	6.3	5.1	0.0
ATTENTIVE	15.2	29.1	15.2	25.3	6.3	7.6	1.3	0.0
ACTIVE	5.1	24.1	20.3	24.1	12.7	13.9	0.0	0.0
RELAXED	6.3	16.5	16.5	29.1	11.4	13.9	6.3	0.0
QUICK TO RESPOND	6.3	30.4	19.0	34.2	7.6	1.3	1.3	0.0
ATTEMPTS DIFFICULT TASKS	6.3	27.8	15.2	20.3	16.5	10.1	3.8	0.0
KEEPS TRYING	5.1	31.6	12.7	30.4	3.8	13.9	1.3	0.0
SELF-CONFIDENT	7.6	34.2	15.2	24.1	6.3	8.9	3.8	0.0
HANDICAP AFFECTED PERFORMANCE	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0